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EDITORIALS

Rubber "Crystals"

FOR many years past, the chemist has been commanding officer in attacks on the inward secrets of rubber. The crude product has been refined to the very limit of chemical purity; it has been analyzed times without number; it has even been made synthetically in the laboratory from starch, from fusel oil, from petroleum and other raw materials. But when asked to explain some of the peculiar ways in which rubber differs from other familiar substances, chemists say, "It is a colloid," and then stop. It is a colloid, but that doesn't begin to tell the story. Rubber is one of the most baffling and mysterious colloids known to man.

When stretched, for example, rubber gets warmer instead of cooling as all well-behaved substances do. This fact has been known for nearly seventy years, but no amount of chemical study has ever explained it. Again, all orthodox substances when subjected to a pull, stretch in direct proportion to the amount of pull up to the point where breaking begins. Rubber stretches relatively much more for a small pull than for a large pull. Still another mystery is that the chemical and colloidal behavior of rubber has always led chemists to suppose its molecule to be extremely large; but under the searching scrutiny of the best modern methods of X-ray analysis, evidence is found that the molecule is quite small.

Physicists, not satisfied with taking refuge behind the much abused word "colloid," are now stepping in where chemists have declined to tread. In Europe the latest devices and methods of physical science are being applied, patiently and skillfully, to the solution of these baffling mysteries. It may be said that a new science has been born; and it has already been christened with the appropriate name of "Rubberography."

One of the most brilliant of recent advances is due to Professor J. R. Katz of the University of Amsterdam. He has photographed the X-ray spectra of thin sheets of rubber under varying degrees of stretch. With no stretch at all, he found, as would be expected, the characteristic X-ray spectrum of an amorphous or non-crystalline substance. The same was true when the samples were only slightly stretched; but when stretched to more than about twice the original length, the photographs began to show, along with the amorphous spectrum, the sort of spectrum which is characteristic of crystals. This effect increased until, at the greatest possible stretch (about ten times the original length) the crystal spectrum was more conspicuous than the other.

Dr. Lothar Hock, a German physicist, confirmed the observations of Katz by an entirely different method. If a piece of stretched rubber is cooled sufficiently, it will remain stretched when the pull is released and will not contract to its former length until warmed. Taking advantage of this fact, Hock "froze" samples of stretched and of unstretched rubber in liquid air and pounded them with a hammer. The unstretched samples shattered in irregular bits like glass, which is the familiar behavior of "frozen" rubber. But the stretched samples did not shatter; they separated into bundles of fibers, much as a flax stalk might. And regardless of the direction of the hammer blows, these fibers all lay in the same direction, parallel to the direction of stretch. Here were the "crystals" of the X-ray spectra, now made visible for all the world to see.

These victories are only preliminary skirmishes; the campaign is being carried on, and more victories may be expected. Physics and chemistry are joining forces as never before, and the inner secrets of rubber structure are being captured one by one.

Brazilian Rubber Plantations

WHILE Americans have been leisurely deliberating on the advantages of establishing rubber plantations in Brazil, others apparently have been taking more than an academic interest in the subject. A recent report states that a British rubber company is planning to acquire and develop, in the home of the Hevea, rubber estates totaling 415,680 acres, and is confident of getting an exclusive concession for a washing factory at Para with a 50 per cent export tax reduction to boot.

A Japanese agricultural commission which visited the Amazon Valley last fall is said to have received much encouragement from the Brazilian government for growing rubber on a large scale. A large Japanese spinning company has already received an immense concession in Brazil for cotton raising, and the concern expects to soon make Japan independent of the United States, India, and Egypt. A leading Japanese authority states that there are now 60,000 of his countrymen in Brazil, and that the reason why the anti-alien law of 1923 is not enforced against them is that they are regarded as desirables who will help to develop the country.

So, too, the prevailing opinion that Brazilian labor costs make competition with the far eastern rubber plantations impossible, may soon have to be revised. If Japanese immigrants instead of natives be employed in raising rubber on Japanese and British plantations the cost of production will undoubtedly be low; and the day may not be far off when the output of grown rubber will be considerably in excess of the best crop of wild rubber gathered in Brazil in a quarter of a century, namely, 41,950 tons in the season of 1912-13.

Growing Cryptostegia in the United States as a Commercial Source of Rubber

Charles S. Dolley, M.D.

Ecologist and Research Chemist, Nassau, N. P., Bahamas.

Cryptostegia madagascarensis Boj. Branch and Flowers

NUMEROUS articles have recently appeared in newspapers throughout the United States describing the experiments which are being made by Thomas A. Edison, Henry Ford and Harvey Firestone looking to the discovery of a rubber yielding plant that may be profitably grown in the United States. The idea is that rubber can be produced on the cotton lands of the south in quantities sufficient "to make the United States indepedent of foreign rubber monopolies."

Although a large number of latex-yielding plants are reported as being under observation at Chapman Field, Florida, practical field experiments appear to be limited to some three or four acres set with plants of the genus Cryptostegia. This includes but two species, *Cryptostegia grandiflora* and *Cryptostegia madagascarensis*. Both species are native to Madagascar, the latter being endemic to that island, while the former has been found widely dispersed in the islands of the Indian Ocean and in India.

Both species have long been known and utilized as sources of rubber, that derived from *C. grandiflora* being known as "Palay" rubber; that from *C. madagascarensis* as "Sombiro" rubber. These wild rubbers together with the "Bokalaky" rubber of their cogener *Marsdenia verrucosa*, and that of the Apocynaceous genus Landolphia have all contributed to make up the consignments coming to European markets under the trade names, Madagascar pinky and Madagascar niggers.

These two species of Cryptostegia, both indigenous to Madagascar, have been known and used as sources of rubber since 1856, and many reports have been made on the quantity and quality of "Palay" and "Sombiro" rubber by the Imperial Institute of London and other authorities. Extensive experiments were made by Sir Daniel Morris when Imperial Commissioner of Tropical Agriculture in the West Indies as far back as 1910 and since then by the writer, in Mexico and the Bahamas.

The writer began the experimental cultivation of *Cryptostegia grandiflora*, in Mexico in 1910 at El Cedro, Coahuila; at Puente de Istla, Morelos, and at Jolnocpa, near El Salto de Agua, Chiapas; and has since then planted it in several of the West Indies, in Florida and in the Bahamas, in which countries it has now become thoroughly acclimated and may be found growing wild in many districts.

Rubber has been repeatedly extracted from both wild and cultivated plants during the last fourteen years at all seasons, and from plants growing under various conditions of soil and moisture, and if there are any persons who care to convince themselves as to whether or not *Cryptostegia grandiflora* yields rubber of high quality in paying quantities they will find ample material growing on the Island of New Providence, Bahamas; and the writer will gladly give them every possible aid towards ascertaining the facts.

Samples of the rubber have been supplied to several of the leading rubber companies in the United States and in England and analyses have been made by their chemists, as well as by government chemists, and the reports, many of which have been published, show the rubber to be of good quality. The Bulletin of the Imperial Institute, Vol. V. No. 4, contains the following report on a sample of Palay rubber from Madras.

"This sample consisted of three flattened cakes. The rubber on arrival was soft, but not sticky, very elastic, and possessed fair tenacity. After keeping for some time, however, it hardened a little, and then exhibited a tendency to tear when stretched.

"A chemical examination gave the following results:

	Samples as Received Per Cent	Calculated for Dry Material Per Cent
Moisture	24.7	
Caoutchouc	67.4	89.5
Resin	5.9	7.9
Insoluble impurity	2.0	2.6

"It will be seen from these figures that the rubber is of very fair quality, the dry material containing 7.9 per cent of resin and 80.5 per cent of caoutchouc."

Field experiments with *Cryptostegia grandiflora* were first started by Mr. Cunningham, Director of the Botanical Garden in Nassau, and were followed in 1912 by extensive plantings at Old Fort Plantations, N. P., by the writer, when several hundred thousand seedlings were set out. An extraction plant was devised by the writer and built by the Walter Lummus Co., Boston, Massachusetts. The results secured were favorable; but the work was interrupted by the world war, which prohibited the use of toluol, the solvent which had proved most suitable. Many of the plants set out in 1912-13 are still growing and have demonstrated the ability of Cryptostegia to hold its own in competition with the indigenous bush.

The obvious conclusion after a careful survey of the situation is, that both species of Cryptostegia may be regarded as possible commercial sources of rubber, but there are many reasons for doubting the possibility of either species being profitably grown on the high priced land of the southern United States. High wages and frosts will prove serious obstacles to success, and it will be necessary to operate central stations, equipped with machinery for utilizing the valuable byproducts, bast-fiber, seed floss, paper pulp, resin, etc. Under favorable conditions, both species of Cryptostegia can undoubtedly become profitable sources of rubber. Such conditions can be found in Central America and Mexico, in the Bahamas and the West Indies, and it is already being cultivated experimentally in India in the territory of H. R. H. Shawani Singh, Rajah of Jhalawar, Jhalrapatan. There are, however, essential conditions other than climate, soil, labor or wages; the market conditions must warrant the large investment involved and adequate capital must be assured.

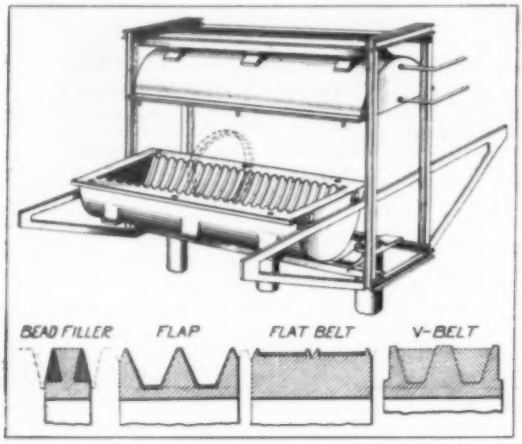
There are numerous rubber yielding plants just as good or better than either species of *Cryptostegia*, indigenous to the southern or western United States, Mexico and the West Indies, or if not already growing there, which could easily be grown. Delay in the

selection of a plant for extensive field cultivation is not due to lack of knowledge of suitable plants, the Asclepiadaceæ, Apocynaceæ and Euphorbiaceæ being rich in latex-bearing plants, as the collections at Chapman Field, or at any botanical garden will show; but to the lack of capital intensively applied to the end sought.

The development of plantation rubber, through the shipment of Hevea seed secured by the Kew Gardens, to the Malay States, was as precarious an adventure, at the time, as would be the planting of acres of Cryptostegia or other well known latex-bearing plants today. To determine whether other varieties of rubber than Hevea can be grown successfully in the United States or near at hand, simply awaits adequate financial backing for the scientific investigator.

Multiple Curing of Flaps and Beads

With the growth of heavy duty pneumatic tires for use on motorbuses and heavy trucks, it has been found that full molded all rubber flaps are a necessity. Ordinary tire flaps are made from calender coated sheeting and napped flannel, cut to width on a slitter, combined, and cured in long lengths on curing drums. For quantity production they present no problems, in fact, they



Dykes' Multiple Curing Press

are so ideally suited to mass production that the large tire manufacturers such as Goodyear, Firestone, and Goodrich market them commercially to smaller tire manufacturers who find it cheaper to buy them than to make them.

The molded rubber flap, being made as a unit, is however a different proposition and brings the manufacturer face to face with the high molding costs of loading, curing, and unloading in single molds.

The bead is another unit which involves molding before being built into the tire. Although some manufacturers have done away with this process by tubing round wire with rubber compound and running it into the casing at the building machine, the majority of tire manufacturers still use the full molded bead for straight side and balloon tires. This bead is first built up on a wheel, the wire being encased in sheeting, frictioned, and calender coated, then molded, cemented, dried, and "flipped" with a piece of frictioned duck before being delivered to the tire builder.

An interesting new development to speed up production on these two units is the multiple curing press, designed to mold beads, flaps, fan belts, etc., in quantity. The accompanying illustration shows the principle of operation. This press is equipped with half shells in series, jacketed for steam. The cavities are designed to take twin rings, each one carrying two rubber flaps.

The press has a capacity of sixty endless rubber flaps per heat. Allowing six minutes for cure and two minutes for change, seven heats per hour are possible, or 3,360 flaps in an eight hour shift. To accomplish the change in two minutes is, of course, the problem. It is done by having the material laid on the curing rings in advance. When the pressman opens the press the bottom shell slides forward on a track and the rings with cured flaps are removed and replaced by another set loaded with uncured stock. Thus the pressman has six minutes to load his rings and two minutes to change the heat.

Under the single mold system, a man could run seven molds, six in and one out, with one minute change time, or a capacity of 128 flaps in eight hours. These figures are, of course, theoretical, but they go to show the production possibilities of the multiple curing system.

The beveled or "feather" edge on the all rubber molded flap is very important, and assuming that the cavities are designed and made correctly, the press must be lined up exactly and the hydraulic pressure be instantaneous to obtain a perfect product. In the single molded process it has often been found necessary to pad the edges of the mold to get the extreme pressure necessary at that point for the tapered edge. It is claimed that the multiple press obviates this difficulty.

The process for semi-curing beads is similar to the above in the multiple press except that the cure is shorter and some time can be saved in changing. It will be remembered that beads are first built up on a wheel. In this case the wheel can be replaced by the curing drum and the building operation be conducted as before. This eliminates the necessity of the pressman laying his own stock. A capacity of 8,000 beads in 8 hours is claimed for the multiple curing press as against 1,000 for the same time by the single molded proposition.

The cross sections show the various types of circular parts it is possible to mold in this type of press. Like the continuous tire vulcanizer, it is a proposition for the large tire manufacturer who has sufficient capacity to warrant its installation. The possibilities of savings, particularly on the rubber flap and bead, are very promising.

JANUARY EXPORTS OF RUBBER GOODS

During the month of January the United States exports of rubber goods reached a value of $5,191,146, as against $4,989,521 for the month preceding. The outstanding feature of the January shipments, according to *Commerce Reports*, was the unprecedented number of automobile casings exported, this record figure being 192,959. With this high volume of casing exports, however, came the lowest unit value in almost a year and a half, and this factor tended to keep down the value of casing shipments.

A decline was also evident in the unit values of several other classes of goods, these including the tire class in general, rubber belting, scrap rubber and rubber thread. In mechanical rubber goods there was also somewhat of a falling-off after the record shipments of December. However, the shipments of all goods of this class are higher in volume than the average 1926 shipments. Notwithstanding increased unit values in January for every item in the rubber footwear class except rubber shoes, there was a decline in shipments in both volume and value, the single exception being in the case of canvas rubber-soled shoes. There were declines in the unit values of scrap rubber and rubber thread, although the total value of the January exports of these two classes of goods, combined with reclaimed rubber, rose to $492,179 as compared with $481,164 for December.

DURING THE CALENDAR YEAR 1926 CANADA EXPORTED 1,152,070 automobile casings, value $14,645,309; 1,135,948 inner tubes, value $2,567,105; and 9,711 solid tires, value $312,526. According to the Trade Commissioner, Ottawa, Canada, the leading purchasers of automobile casings were: the United Kingdom, 205,657 casings, value $2,522,864; Argentina, 99,637, value $1,097,764; New Zealand, 87,036, value $1,408,187; and Australia, 75,984, value $1,101,987.

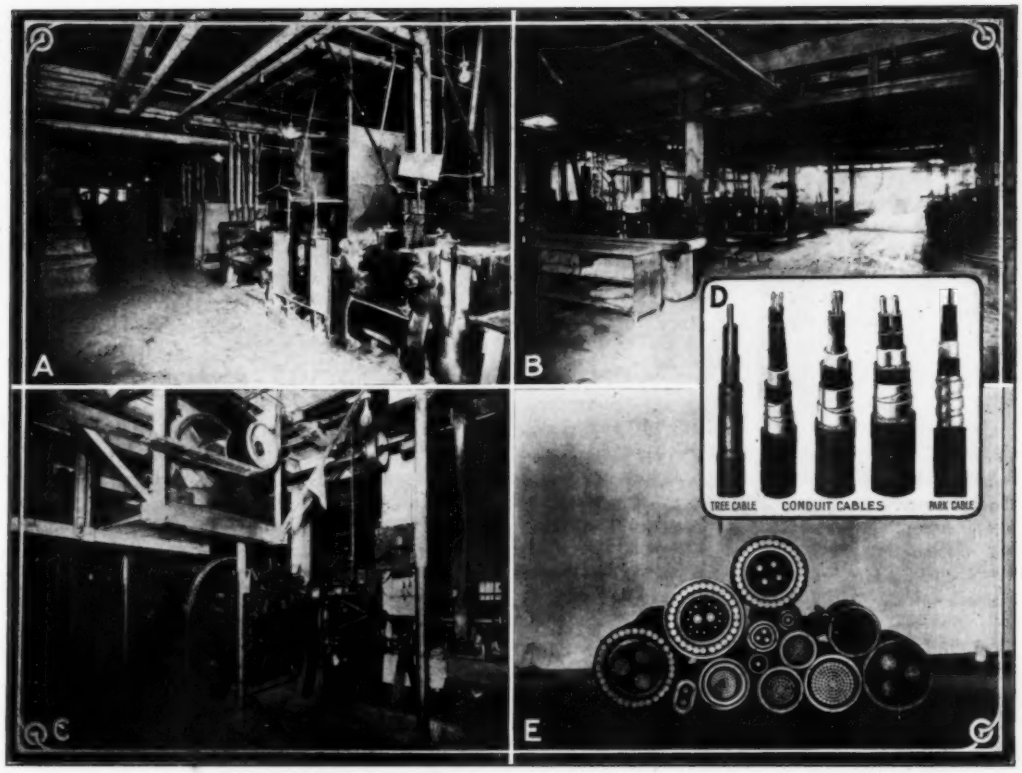


Fig. 1. A—Rubber Mill Room. B—Insulating Department. C—Cabling Machine. D—Partially Stripped Cables. E—Sections of Typical Cables

Insulated Wire and Cable Manufacture

Highly Technical Branch of the Rubber Industry—Factory Equipment—Rubber Compounding—Laboratory Control—Types of Cables—Rubber, Cambric and Paper Insulation

THE manufacture of insulated wire and cables is probably the most highly technical division of the rubber industry. Its products are designed and constructed for peculiarly exacting service. Perfection of insulation is essential and there is no room for second quality. Therefore the cable maker, in addition to the usual run of rubber technical problems, is beset by numerous electrical engineering difficulties incident to insulation for lighting, power transmission, submarine and telephone work. In consequence cable companies must maintain laboratories not only for chemical and physical control of materials but for research in low tension and high tension electrical service.

Rubber Working Equipment

As regards the various preparatory processes of washing, drying, milling, compounding, etc., practically the same rubber working equipment is used in a wire and cable plant as in an ordinary tire or mechanical rubber goods factory.

Figure 1-*A* pictures a wire and cable mill room containing standard 2-roll mills. Modern internal mixers are also included in its equipment but are not within view.

Wire Insulating

Application of rubber as wire insulation is done by one of two methods. In the strip covering process ordinary calendered sheets are cut to suitable width. The strip is then fed by a machine and enfolds a group of parallel wires passing separately through grooved wheels. These compress the strip upon the wires, severing the rubber and joining its edges on each side of each wire. The second method is by the tubing machine which applies a seamless covering. Each method has its advantages which need not be discussed here.

An insulating room equipped with tubing machines is pictured in Figure 1-*B*. In this department warmed rubber composition is fed automatically into the machines. These apply it with great accuracy and smoothness as the wire passes through the die at very high speed. The same illustration also shows the large circular pans used for receiving and curing the covered wire. The latter operation is effected in ordinary horizontal vulcanizers operated under automatic time and temperature control.

Apart from the distinctly rubber making machinery much of the equipment in a wire and cable plant pertains to preparing wire for insulation previous to its later combinations by braiding or cabling. In these constructions special equipment is employed for impregnating, lead covering, etc. Whatever the construction of the product it is subjected to electric tests preceding each step of its manufacture. The tests most frequently applied to insulated wire and cables are those for insulation resistance, electro-static capacity and voltage breakdown.

Special Compounding

The control of insulation compounding requires clean rubber and close analytic checking of compounding ingredients, for the presence

Fig. 2. A—Chemical Laboratory. B—Experimental Mill Room. C—Physical Testing Laboratory

of all impurities injurious to the electrical properties of the insulation product. For example, each lot of zinc oxide is analyzed to determine the amounts contained of such harmful impurities as zinc sulphide or zinc hydroxide rather than for its content of zinc oxide. The same general rule applies also to the other ingredients which must be substantially free of anything deleterious to the dielectric quality of the insulation mixing. The presence of moisture is particularly inadmissible, and to eliminate it all powders are stored in heated bins.

Laboratories

Laboratory control of processes is accepted as an essential factor in good rubber manufacturing practice. In no branch of the industry is the control more vital than in the manufacture of insulated wires and cables where service is dependent upon faultless product.

The vital importance of the chemical, physical and electrical laboratories in a cable plant is indicated by the space and equipment devoted to them in the plant of one of the largest producers of rubber covered wires and cables in the country. These laboratories are shown in Figures *2* and *3*.

Types of Cables

Electric cables are classed by their insulation into three types, rubber, cambric, and paper. Cross sections of several of the many constructions produced in these types are shown in Figure 1-*E*, each being designed for some special service.

Rubber Cables

Rubber cables are specified for use where the voltage does not exceed 5,000. Above that tension, ozone is liable to form within the cable. Its effect is to destroy rapidly the integrity of the rubber insulation and render the cable worthless.

All copper conductors, previous to rubber covering, are tinned over to prevent the sulphur present in the rubber composition from acting on the copper with the formation of copper sulphide.

The tinning process comprises passing the wire through a tank of cleaning solution resembling a soldering flux, thence into a bath of molten tin electrically heated. As the wire emerges from the tin bath it runs through a wiper which removes the excess of metal. It is cooled by passage through a tank of water and then reeled up. The tinning operation is very rapidly done and is conducted in a long straight run. In some cable constructions the wires are rubber coated singly, in others they are stranded before covering. The construction of several well-known rubber insulated steel taped cables is pictured in Figure 1-*D*. Here the separate protective coverings on three different arrangements of conductors are shown with steel tape armor under the tarred jute exterior. The entire covering is thoroughly filled with a tar compound to exclude the air.

These steel taped cables are practically self contained conduit systems that will endure indefinitely when buried in the ground. The making of the completed cable depends largely upon three main items in the application of the protective coverings, namely, proper jute bedding and outside covering; adequate thickness and method of applying the steel; thorough filling with tar compound. Figure 1-*D* also shows the construction of a single strand park lighting cable with special interlocked armor and a lighting cable for service among tree branches. In the latter instance protection against abrasion is effected by an armor of special stock. It is hard, fibrous, flexible, and capable of withstanding long continued chafing without appreciable wear. This particular stock is so tough and resistant that 2,000,000 strokes of a hard wood rubbing shoe are required to wear through a layer of it, 3/64-inch in thickness.

Filling and Armor

Jute, both under and over the steel tapes, is applied in the form of a close, uniform serve for filling the angles of the cabling. It is thoroughly saturated with a tar compound to protect and preserve the fiber. The jute bedding is thick enough to eliminate all danger of damage to the lead sheath. The outside jute serve affords ample protection against exposure of the steel tapes with consequent danger of rust. Experience has shown that two tapes, each .035-inch thick, are necessary to protect the lead sheath against earth pressure, sharp edges of stones and possible blows from tools. When the two steel tapes are wound in reverse or opposite directions the maximum space left uncovered by the steel can be only a series of small diamond shaped openings. This method affords the greatest possible mechanical protection for the lead sheath.

Cabling Machines

The spiral winding of materials on a cable core is done by a cable machine as shown in Figure 1-*C*. The core to be cabled is wound on a reel and mounted at the rear of the head. It passes through the latter upon which are suitable supports for the material which is applied to the core as the head revolves. Jute filling is applied in this way. Also varnished cambric or paper in strips.

Varnished Cambric Cables

Varnished cambric cables are so called because the insulation used consists of layers of closely woven cotton cloth, both sides of which are coated with multiple films of insulating varnish, and a viscous, moisture repelling, non-drying filler between the layers. Such cables are not affected by ozone or static discharges as is the case of rubber insulation when subject to excessive voltage. Therefore cambric cables, not being easily overstressed, are especially suited for high tension service. Being more flexible than paper cables, cambric cables are more easily joined, and can be installed at lower temperatures with less risk of injury. They are particularly fitted for any service where the temperature is high or where there are sudden increases in voltage of considerable amounts for short periods. When lead covered and armored they make excellent submarine cables. Mineral oil has no effect upon varnished cambric, hence such cables can be used as leads for transformers and switches where it is necessary for the leads to be carried into the oil.

Paper Insulated Cables

The demand for electric light and high voltage power transmission cables with paper insulation is increasing rapidly. The

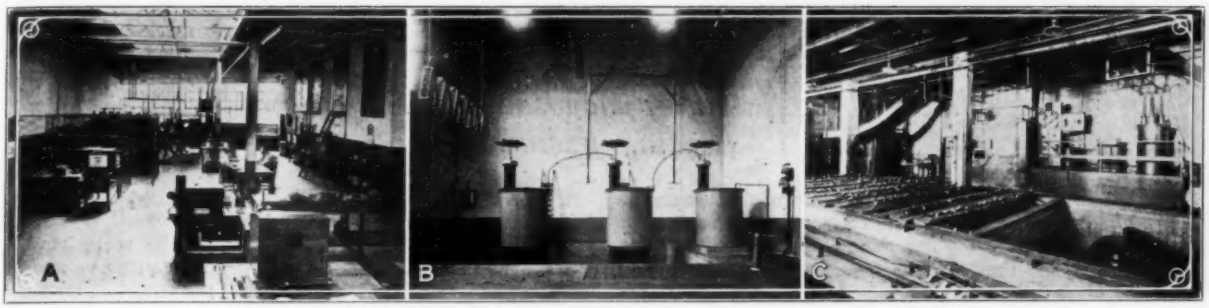


Fig. 3. A—Low Tension Testing Laboratory. B—750,000 Volt High Tensicn Testing Set. C—Testing Tanks

paper should be of manila fiber, free from jute, straw or other low grade loading materials. Paper has practically no elasticity and therefore must be applied spirally in narrow strips so that the cable may be bent without injury to the insulation. It is necessary to thoroughly dry the paper and impregnate it with compound in order to increase its dielectric strength and render it as non-absorbent to moisture as possible. Any treatment of the cable should be such that the slip between the layers is increased rather than impeded. Thus compounds which solidify at low temperatures, dry or gum at high temperatures, or harden with age are unsuitable.

The paper used for insulation is a specially strong manila of 50 per cent bibulous structure to take up the impregnating fluid. It is prepared for application by first cutting it into strips on a slitting machine, then reeling it for use in the winding and cabling machines. The angles formed as the cable is made are filled solidly with twisted crimped manila in rope form. It is essential that all air and moisture be excluded from the cable structure and complete oil impregnation of the paper be effected down to the conductors. Therefore, previous to impregnation the reeled papered cable is placed for several hours in a hot chamber and thoroughly heated to expel all moisture. After drying, the reels are packed into a 20-foot autoclave where the cable is subjected to vacuum for a number of hours to remove all of its contained air. Then, with the vacuum still on, the impregnating oil is admitted to fill the autoclave for impregnating the cable. Sufficient time is allowed for complete absorption of the oil into the paper, then the reels are removed and the cable finished by being encased in a seamless lead covering or sheath.

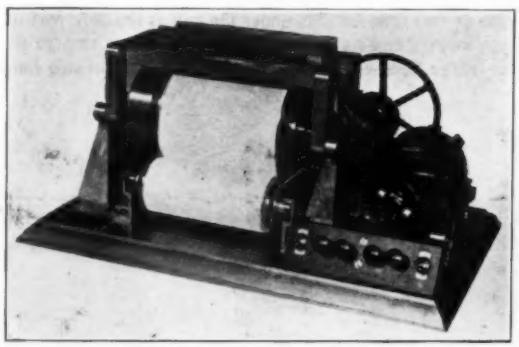
A paper cable depends for its serviceability upon the lead sheath and it is good practice to make this thicker than for other kinds of insulation. Commercially pure lead is preferable for cable sheathing, however from 1 to 3 per cent of tin is sometimes added to harden and strengthen the metal. This requires great care in mixing the two metals as they will not alloy evenly. For soft core, dry paper telephone cables the use of tin or antimony is recommended but for light and power cables many engineers consider that there is not enough advantage to warrant the extra cost over pure lead sheathing.

Hydro-electric power production and transmission at increasingly high tensions have caused cable makers to design and perfect cables suitable for conducting the current safely. This is being done by installing at the cable works research and testing facilities of exceptional capacity in order to anticipate power developments well in advance of actual needs. A notable instance of this is the installation of the high tension testing facilities of 750,000 capacity shown in Figure 3-*B*.

Acknowledgment is here made to the Simplex Wire & Cable Co., Boston, Massachusetts, for the courtesy in supplying pictures of the plant and laboratories, and data from the Manual for Electrical Engineers.

VIBRATION RECORDER

The engineering laboratory of the Firestone Tire & Rubber Co., Akron, Ohio, has developed the type of instrument here illustrated, for recording the number of vibrations whose acceleration exceeds



Instrument for Measuring Automobile Vibrations

a predetermined value. The instrument consists of four principal parts: a supporting frame; an inertia element; elastic supports for the flexible element; and a means of opening or closing contacts between the inertia element and the frame.

When this apparatus is placed upon vibrating vehicles the contact will open when the intensity of vibration becomes greater than the effort exerted by the elastic support. The change in position of the contacts operates a pointer, making a record on the chronograph paper. Each element in the multiple element instrument is set to operating at a definite intensity of vibration. Counters have also been developed to replace the chronograph record. The instrument can be placed on a motor car and the total number of vibrations can be read directly from the counters as the motor runs over the road.

Further research is in progress to secure a simple, reliable, rugged instrument capable of measuring the effect on the passenger of road irregularities as influenced by the various elastic portions of the motor car.

CRUDE RUBBER AND TIRE REQUIREMENTS—1927

The probable crude rubber and tire requirements of the United States during 1927 have been estimated in a bulletin covering world production and consumption of rubber as published by Hymans, Kraay & Co., of London, England. According to this source of information, the world consumption of crude rubber during 1926 totaled 538,000 tons, the share of the United States in this total being 360,000 tons. It has been estimated that American consumption during 1927 will advance 10 per cent to 396,000 tons, while that of all other countries combined will rise from 178,000 tons in 1926 to 200,000 tons in 1927, a grand total of 596,000 tons. The possible production of plantation and wild rubbers during the present year is figured as reaching 692,000 tons. The probable tire requirements of the United States in 1927 are also estimated at 69,060,000 units, this figure including 49,060,000 tires for replacement, the remaining 20,000,000 representing new equipment.

The 1928 Rubber Footwear Line

Evolution of the Galosh—Fancy Low-Cuff Gaiters Are the Leading Features

PROBABLY at no time since the inception of the industry do the rubber footwear manufacturers approach a season with so great a degree of promise, and at the same time run so close to the danger line. Despite the fact that the best retail selling conditions for several years have been prevalent during the past winter, the industry finds itself operating on the same basis as the rest of the industrial world, namely, plenty of volume but very little profit. Prices were cut 12½ per cent January 1, and there have been several minor revisions downward since that date, especially on new types of shoes.

It is the prevalence of new shoes and new types of colored numbers in the line where the element of danger comes in. Evolutions of the galosh are, in a sense, nothing novel. They have been appearing every season for the last five years in various forms such as the Radio Boot, Oh Boy Boot, Domino, Astrakan, Zipper, Sheba, and hosts of others. The start of the novelty craze can be traced back to last year. At the end of the 1925-26 selling season Converse put out a new cuff overshoe called the Bobbette, made in two-tone tan and grey colors with checkered noncrocking fleece lining. A little later the United States put out a low-cuff gaiter with automatic fastener made with an imported tweed fabric called the Radcliffe; Goodrich soon had a competing number with the women's Lo Tweed Zipper; and Cambridge put out a very popular low cut gaiter with snap strap called the Raynboot.

These were the leading novelty shoes carried in the 1927 line when the first selling weather came early in December. Much to the surprise of the manufacturers the supply of fancy overshoes was way short of the demand, as the public seemed to prefer them to the conventional black automatic fastener gaiters.

In as much as there was very little time between these results being evident and the January 1 period when samples of new lines ordinarily go to the trade, the 1928 lines are not yet complete, and every week sees the addition of some new novelty line or some variation in existing types. This has helped to unsettle the price situation as the shoes, being of slightly different construction than any previous types, involved more risk on account of their novelty and colors, and it was difficult to determine the ultimate cost of fabrics. For this reason most of the price changes since the first of the year have been on novelty shoes.

It is hoped that the addition of so many colored numbers in low cut overshoes will broaden the market. With lower selling prices there is the possibility that women will buy two pairs to match various gowns and stockings, and wear them earlier in the fall and later in the spring. This feature is being stressed in the Cambridge advertising program on Raynboots.

On the other lines of winter footwear, such as boots, lumbermen's, light and heavy rubbers, there is little startling or new in evidence. These fields are now the "bread and butter" of the business, and it is a good thing to have something in the way of staples to counterbalance the extravagance in gaiters.

The United States Rubber Co., in announcing its line, says: "Each item in the line has been priced with the thought of trying to give attractive resale values to the ultimate wearers of the merchandise, which in turn will mean increased sales for the retailer. A careful study of the new prices will show that this fundamental idea of resale values has been carried through in an able manner and should tend toward a larger volume on rubber footwear for the retail stores." A brief survey of the new prices shows the reductions for the whole trade as the United States prices are used as standard for the industry. Men's Blue Ribbon Short Boots are now $3.40 as against $4.25 last year. Blue Ribbon Giant High Bootee, generally known in the trade as a pac shoe is $3.35 as against $4.50. Men's Walrus, four-buckle all rubber gaiters are priced at $3.15, a drop from $4.00. Women's Countess, an automatic fastener gaiter corresponding to the Zipper is now priced $3.35 a drop from $3.75. Women's Peary, cotton four-buckle gaiter, dropped from $2.10 to $1.75.

Light rubbers did not drop as much in proportion as they are figured on a closer margin. Men's first quality sandal rubbers such as the United States Richmond are back to $1.00 from $1.10; women's are priced at 70 cents compared with 81 cents.

The United States line of fancy gaiters shows a wide range. The Radcliffe, a low cut tweed gaiter with a tweed cuff which had such a wide sale last year is priced at $3.25. This shoe carries an automatic fastener, of which the United States has a new type which is light, durable, and easy operating. Another line of fancy gaiters carrying the automatic fastener is the Streak, made of cotton, with a fancy fleece lining and mixed corduroy cuff priced at $2.80 for the women's.

The low cut fancy gaiter line is even more complete. This type of shoe is destined to be very popular the coming season as it can be worn in light rainy weather as well as mid-winter, and has no complicated fastening devices to hinder putting it on or off. One or two snap buttons under the cuff is the only part of the shoe that fastens, and its ankle height makes it very easy to slip on or off. Three lines are offered by United States in this number,

U. S. "Tempest" U. S. "Aristocrat" U. S. "Radcliffe" Goodrich "Lo-Zipper"

the Aristocrat, at $2.45 made with tan wool jersey, adjustable strap and fancy silk striped cuff, the Fashion at the same price with tan or gray tweed uppers, and the Tempest at $1.60 made with black cotton jersey and plaid cuff, also carried in colors, and mixtures.

The Hood line carries the following features: Mode and Vogue, two new lower cut dress arctics, the Mode in black and fawn color and the Vogue in black; colored footholds to harmonize with the popular shades of hosiery and dress. The Slicker Boot is an attractive, extremely practical novelty for the younger folks. It is a light weight flexible boot made red color with black vamp and carrying a picture of a duck waddling along with an umbrella on the side. The boot carries felt insoles, and is made to put on over the shoes thus keeping the feet and legs warm and dry and preventing colds. It can be rolled up into a very small package and is reasonably priced at $1.85.

The Huntsman, another new number, is a lightweight crepe sole lace boot, made extra light for sport wear. Another new number in the Hood heavy goods line is the Red Tread Mine King, a 15-inch pac. The Hood Kattle King, well known all rubber gaiter for men, has a new number in the six buckle for special farm use. A Trapping Boot has been added to the line which possesses the feature of cleats on the outsole for sure footing. In fact the sportsman has much to interest him in the Hood line of heavy footwear.

The B. F. Goodrich Co. owes its increase in footwear business to its acquisition of the hookless fastener rights in 1923, and the 1928 line shows still more extended use of this very efficient and practical device for overshoes. The black wool jersey full height Zipper which was the original shoe is still carried in four lasts for men and seven for women. The Lo-N-Hi Zipper is made in featherweight style with a fancy rayon lining and the top can be turned down to give cuff and low shoe effect, outside colors, being black, beige, and gray. The standard weight carries a light net or fleece lining in the same colors. These are all priced at $3.35. The cotton Zipper is made with aberdeen cloth in black, mottled brown, mottled gray, and sand colors, fleeced lined, and priced at $2.80. The Lo-Zipper is made with ecru net lining in black and beige, and tan and gray fancy worsted tweeds, priced at $3. The same shoe is offered in the $2.60 grade, made with black cotton jersey, cotton tweed jersey in tan and gray with striped rayon cuff, the misses and children's Zippers in black, mottled brown, gray, and sand, and a high and low cut men's Zipper completes the line of automatics. In the $1.60 class the women's Co-Ed, a low cuff shoe, is made in five colors with velvet cuffs to match.

The Firestone Footwear Co., Hudson, Massachusetts, features its Ritz line of low cut gaiters with a variety of types, that are stylish, distinctive, and individual. These gaiters are produced in six attractive designs, with cuffs of either velvet or striped and contrasting material. All are made of grey, tan, fawn or black tweed jersey, and have grey or tan check linings. The colors and foxing combinations have been selected to harmonize with the different fabrics used, while an effective adjustable snap-fastener gives a trim, snug fit. The Firestone Faseal gaiters, in either the high or low cut styles, are being made for men, women and children. Like the Ritz gaiter, the designs for women and children are produced in grey or tan tweed jersey, with grey or tan Multifit soles. The black jersey Lo Faseals are made for men and women only.

The Cambridge Rubber Co., originators of the Raynboot gaiter, makes the following announcement in its new price list: "Although completed for more than a year, Camco has declined to make a general announcement of the automatic fastener until exhaustive wearing tests have proved it satisfactory. Thousands of pairs have been worn through the past two seasons with complete satisfaction." The fastener is further described as being smooth in operation, positive in action, flexible in wear, and neat in appearance. Each unit is separately mounted, thus retaining maximum flexibility. The automatic Raynboots are made in full height in black and fawn wool jersey at $3.35, in cotton at $2.80, and low cut wool in colors with fancy cuff at $3.25, and $2.60 for cotton. The low cut snap type Raynboot line has been broadened to include many new fabrics. Wool and rayon jersey are used in a $2.50 shoe, making a very striking effect. The regulation wool jersey Raynboot in black, gray and fawn is $2.45, the black glengairn cotton at $1.65, and a tan and gray mixture of cotton at $1.60.

Converse Rubber Shoe Co. has retained the leaders of the 1927 line such as the Bobbette and Spryte and has added ten novelty shoes in 36 different combinations of colors and trimmings. In the 7 inch automatic fastener class, there are the Scotty, a heavy all wool tweed made in brown and gray, the Frolic, a sport flannel checkerboard pattern in red and brown, the Natty, of colored worsted jerseys, the Charm, made of brown and gray mixed tweeds, salmon and pepper mixed tweeds, and the Nobby, carrying cotton fabrics in plain colors. In the ankle height gaiters, there are the Pert and Fritzi, carrying the same fabrics as the 7 inch line with velvet cuffs, and the Chic, a $1.60 shoe made with cotton jersey in black, and tan, and fancy cotton jerseys, in black Partridge pattern, tan Partridge, Beaver, and Steel mixed jerseys.

Perhaps the two most distinctive shoes in the new Converse line are two numbers designed for the better class of stores, the Nan and the Alsace. The Nan is an ankle-height gaiter made from Angora fabric, which is a goat's hair cloth of very hard and durable finish in four colors, brown, blue, red, and heather mixed. This fabric is unique in that it can be washed with soap and water on the shoe and retains all of its original luster and brightness. The Alsace is made from an all worsted serge material which is popular for women's dresses and coats and is offered in the popular colors, tan, brown, gray, and green. All of the Converse line carry checked fleece lining, and the tape on the automatic fasteners matches the fabric in the shoe.

Gutta Percha "Gloshette" **Converse "Charm"** **Dominion "Rain-Slipon"**

The LaCrosse Rubber Mills Co. is offering a line of novelties which compares well with the leaders. In their latest broadside, they comment as follows: "The big sellers in our rubber footwear line for next fall and winter are autogaloshes and novelty gaiters. The tweed fabrics used in Gloria and Nanette autogaloshes are more expensive than the black jersey cloth used in similar styles. These styles also have linings of tweed fabrics, the same as used on the outside of the gaiters and the linings are seamless back, and continuous, turning over onto the cuff, eliminating all seams where the cuff joins the quarters." A feature of the line is the Cynthia, a full height automatic fastener gaiter with cotton tweed jersey cloth.

The Beacon Falls catalog shows a full line of footwear including the Speed and Nifty, Top Notch automatic gaiters. The announcement to the trade mentions some new numbers for fall delivery which back up the reputation of this mill for quality and individuality. These are the Goldie, in buff and gray, the Peggy and the Trixie.

Tyer Rubber Co. features the Sno-Boots, a line of automatic fastener gaiters with the fastener at the side instead of in the front. The women's tan Sno-Boot carries a wool jersey upper, trimmed with a top of fancy brown velroy. A line of low cut cuff overshoes is offered in colors with velour cuffs, and the Faun and Regal shoes will be made in special cuffs when ordered in quantity. The Tyer line of light rubbers is known as hot-pressed owing to the special construction whereby the upper and lining are calendered together, insuring greater adhesion and flexibility. Unlike the ordinary rubber they carry no back seam, are reinforced on the outside, and are very comfortable on the foot.

The Snag-Proof line of the Lambertville Rubber Co. and the Gold Seal line of the Goodyear Rubber Co. are now being marketed through the same selling organizations although the lines carry individual features developed in these well established mills. Lambertville features the Stout's all duck snag boots in heavy goods for which the line is famous. A line of automatic fastener gaiters is carried, the Whiz-On in wool fabrics, and the Streak in cotton fabrics. A line of novelty gaiters which has sold well during the last winter is the Slik-R, which has a moire rubber vamp, run on an embossed roll, priced at $1.55, making it the lowest priced novelty gaiter on the market.

The Goodyear line carries many styles of buckle gaiters not made by the other companies, such as the six and two-buckle heights. Novelties have not been neglected either with the Van-O-Tee, a one strap cuff gaiter made in gray and tan tweed uppers and the Step-R gaiter made with fawn and gray jersey. A full run of heavy rubbers such as the Atlas with gray sole and the Ajax with red sole are examples of the type of merchandise for which the Gold Seal line is famous.

Mishawaka Rubber & Woolen Co. has a very attractive line of novelty shoes made from fabrics of their own manufacture. The Ball Band line of heavy goods and rubbers is still preeminent in the farm and country trade and has many new features.

Although there is no competition between Canadian and domestic merchandise in footwear owing to duty barriers, the trend of styles in Canada for the coming year is much the same as that in this country. Among the companies who have already announced their styles for next year are Canadian Goodrich, Kitchener, Ontario; the Northern Rubber Co., Guelph, Ontario; the Miner Rubber Co., Granby, Quebec; the Dominion Rubber Co., Montreal, Quebec; the Kaufman Rubber Co., Kitchener, Ontario; the Gutta Percha & Rubber Co., Toronto. Canadian prices are higher than current quotations in the United States. For example, full height automatic fastener gaiters are $3.85 in Canada and $3.35 in the United States.

The gutta percha line is featured by the GP vent process boots of which the leading number is the Plymouth at $4. Pressure cure is used throughout the heavy goods line. The Dominion Rubber Co. has perhaps gone into the novelty end of the footwear business more than some of the other Canadian producers and has some very attractive low cut numbers made with jerseys and rayon, and an ingenious construction of employing snap fasteners. Canadian Goodrich line is designed along the lines of the American Goodrich featuring the Zipper line of automatics and novelties. Miner Rubber Co. has a widely diversified line of rubber goods, covering heavy footwear, light rubbers and arctics, raincoats, rubber hats, and tennis. A unique advertising scheme employed by this company is the use of pictures on soles in the form of a medallion which serves to identify the product to the wearer. Kaufman Rubber Co., manufacturers of Lifebuoy brand of footwear, makes the full line of footwear and is showing a very attractive and diversified line of heavy goods. Among the Northern Rubber Co.'s leading numbers is the Hunter hunting boot made with a real leather top.

AMERICAN PRODUCTION OF TIRE FABRICS

Data collected in the biennial census of manufactures taken in 1926 include some interesting figures regarding the manufacture of tire fabric in the United States. From the tabulations below it will be noted that the production of cord fabric for tires represented a great increase in both volume and value in 1925 as compared with 1923, while that of fabrics other than duck and cord showed a corresponding decrease. A decline in volume is evident in the 1925 figures for sheetings, drills and tire duck. It is stated that in 1919 the production of tire duck totaled 123,465,000 square yards.

	1925	1923	1921
Tire duck—			
Pounds	32,081,733	63,858,718	56,056,431
Square yards	40,761,508	68,258,927	51,722,845
Value	$16,628,610	$42,324,027	$57,738,475
Cord fabric for tires—			
Pounds	140,492,454	60,269,377	
Square yards	176,964,466	100,727,166	
Value	$80,478,625	$39,631,780	40,190,848
Tire fabrics other than duck and cord—			43,933,691 $43,913,959
Pounds	16,771,008	39,558,849	
Square yards	24,400,485	57,569,014	
Value	$8,518,659	$24,123,826	
Ounce duck, except tire—			
Pounds	97,371,485	79,921,485	61,040,975
Square yards	161,883,782	139,221,366	97,033,262
Value	$40,295,987	$42,766,224	$21,793,633
Numbered duck, except tire—			
Pounds	33,843,802	31,333,334	35,804,467
Square yards	31,449,971	27,862,308	38,166,796
Value	$13,531,070	$14,397,179	$13,149,213
Sheetings—			
Pounds	369,375,945	409,492,151	381,352,105
Square yards	1,638,168,738	1,695,520,069	1,600,998,979
Value	$180,357,058	$208,338,025	$158,216,314
Drills—			
Pounds	103,457,753	105,309,534	70,999,578
Square yards	286,114,586	303,420,862	191,715,280
Value	$42,388,768	$46,761,510	$22,031,291
Osnaburgs—			
Pounds	53,891,002	49,988,195	45,197,728
Square yards	118,068,963	109,101,142	100,039,127
Value	$18,448,738	$19,539,170	$11,767,447

RUBBER CONSERVATION BY UNITED STATES

Statistics prepared by the Department of Commerce show that measures for the conservation of rubber were seriously considered by the United States in the year 1926. During that year, although car registration was ten per cent higher than for 1925, the actual consumption of rubber was only 366,000 tons, as compared with the 1925 consumption of 388,000 tons.

In addition to this, the stocks of automobile casings held by manufacturers increased by 2,314,000 while inner tube stocks increased by 4,887,000, a further saving equal to 12,500 tons of rubber. Even the combined total saving thus achieved of 72,500 long tons does not represent all that was accomplished, since nearly 2,000 more tons of rubber were required in original equipment for new automobiles, the production of which increased in 1926.

The stocks of rubber on hand in the United States increased during the year 1926 from 51,215 long tons at the beginning of the year to 72,520 at its close, while during the same period the London stocks advanced from 5,697 to 48,921 tons. There would consequently have been a short supply had it not been for the American conservation measures.

The degree of restriction in British Malaya and Ceylon continues at 30 per cent below the possible production with the prospect of increase in restriction to 40 per cent below production possibilities. The restricted area produced 64 per cent of the world's rubber in 1922 before restrictions, and produced about 56 per cent in 1926. Whether this further restriction will again raise prices and result in further American rubber conservation can be seen.

Rubber Planting Possibilities in Latin-America

Six Million Acres Available in Northern Tropical America—Advantages and Present Obstacles Considered—Possibilities for Successful Plantation Industry Good

THE subject of an American capitalized rubber plantation industry has been before the public ever since this country realized its dependence upon foreign sources for its essential supplies. As a result of much agitation in the press and on the floor of Congress, the Department of Commerce was instructed "to investigate and report on the possibilities of developing the plantation rubber industry in the Philippines and Latin-America." This investigation was made to cover practically all possible plantation areas in the countries lying within the tropical belt in both hemispheres. The results of this thoroughgoing crude rubber survey have been published from time to time as bulletins in the Department's Trade Promotion Series. The latest of the series[1] is in every way a fit companion to the other valuable reports of this crude rubber survey.

Are More Rubber Plantations Wanted?

It may be argued that it is futile to interest capital in extending rubber plantations when rubber is selling around 40 cents a pound and when the British Government has reduced exports from the Middle East plantations in an effort to stabilize an overstocked market. While this is to a large extent true, the analogy with our cotton planter, may probably answer the objection. The cotton planter is being told to plant cotton in the face of a huge carry-over of his crop, the argument being that he should reduce his production costs. The farmer with high production costs, like the manufacturer with high production costs, is the one who suffers in periods of rock bottom market prices. So, the rubber planter need not curtail his plantings if he can at the same time reduce his production costs and measure his own output within what his government and trade agencies have indicated as a reasonable economic production limit.

British Growers Increase Acreage

Also, considering that it takes from four to five years for a rubber estate to reach the production stage, and allowing from one to two years for the work of clearing jungle, and preparation of the land and nurseries and so on, the capitalist interested in rubber growing would have to consider, not the present market, but the market seven to ten years hence. That the experienced British rubber growers are not missing any bets as to the future may be seen from an item in the Singapore papers. "From Malayan sources we learn that the older rubber companies are making up for lost time, as regards extension of new plantings. Of sixteen British companies, whose annual reports have recently appeared, nine had applied to the government for more land and the remainder were on the lookout for more land." The chief secretary of Federated Malay States a short time ago publicly expressed amazement at what he called the hectic striving for new areas, and for rubber of all things. The government had been asked to restrict output and now the planters were rushing in to increase the acreage of their plantations.

The World Will Need More Rubber

Assuming that the argument of Lt. Col. J. C. G. Kunhardt, as discussed in this journal[2] is tenable, and that, as far as can be seen at present, our automobile industry will continue its remarkable prosperity, then the question of future supplies of crude rubber becomes interesting to capital, and to American capital most of all. For indications are that consumption of crude rubber will in a few years overtake production. American manufacturers have heretofore enjoyed a comparatively low market price for rubber, considering the average price of this commodity over a long number of years. There is no assurance that they will be in such a favored position in the future, unless they can in some way get into a position as regards production which would serve as a check to any unfair price raising by foreign producers. To help the American consumer into a realization of his position has no doubt been one of the purposes of the government's crude rubber survey. And so we now come to a discussion of the report dealing with our northern tropical Latin-American republics and the possibilities of rubber growing within their respective borders.

The report informs us that in the northern part of South America and in the Central American countries at least six million acres of land are available for Para rubber plantations. Climate and soil in these areas are favorable to successful rubber production. The countries best suited to rubber cultivation are reported as follows:

Southern Mexico—Southern Tabasco, northern Chiapas region and parts of southern Chiapas, Vera Cruz, Campeche, and Quintana Roo.

Costa Rica—A wide east and west belt (the San Juan Plain) in the northern part, draining into the Caribbean, through the San Juan River and south of this a narrower north and south coastal belt bordering the Caribbean and as far as the Panama boundary.

Panama—A comparatively narrow belt along the northern coast, broader to the west of the Canal Zone than to the east. Also lands in the Tuyra, Chucunaque and upper Bayano Valleys, all of which drain into the Pacific and lie in the Province of Darien.

Colombia—A narrow belt on the Pacific Coast; part of the valleys of the San Juan and Atrato Rivers, parts of the upper Sinu Valley, the upper half of the lower navigable portion of the Magdalena River.

Venezuela—Three areas on or near the northern coast and parts of a large, rather inaccessible area, which borders on Brazil and covers the upper drainage basins of the Orinoco and Negro Rivers.

Western Ecuador—A belt along the western base of the Andes, extending nearly the length of the Republic.

It is estimated that each of the above countries could provide a million acres of very suitable land. Other countries having desirable areas but less intensive are Guatemala, Honduras, Nicaragua, the Guianas, Haiti and Trinidad.

These lands can be obtained by concession, lease or purchase at a very low figure, say $1 to $5 per acre from private holders or from the government. All through South America, the tax on improved land is either very small or is not imposed at all.

[1] "Possibilities for Para Rubber Production in Northern Tropical America"—Crude Rubber Survey. Trade Promotion Series, No. 40. U. S. Department of Commerce.

[2] "The Statistical Position of Crude Rubber."—THE INDIA RUBBER WORLD, February 1, 1927, page 257.

The Natural Advantages

The several natural advantages of these Latin-American countries over areas now available for new planting of rubber in the Orient are superior transportation facilities, availability of land already cleared of original jungle, absence of destructive grasses, such as *lallang* or elephant grass so common in the Far East, soil in which the tractor and plough could be used preparatory to planting, and the low cost of land. Another advantage is the existence in the more favorable countries of huge areas, formerly banana plantations, which could be cleared and planted at a very low cost. All of these countries are within eight days' steamer passage from New York as compared with a five or six weeks' journey from Singapore or the Dutch East Indies, the present exporting centers of crude rubber.

The Limitations

The report discusses the limitations and possible handicaps. Under topographic limitations are noted large areas of swamp in the coastal belts, and along rivers and at their mouths. However, it must be recalled in this connection that the same conditions are found in the Malay Peninsula and in Sumatra. In these Oriental rubber growing countries, the best rubber estates are now to be found somewhat inland and on rather higher ground. In northern tropical America there are still six million acres of rubber land whose soil and climate are equal and in some places superior to the rubber areas of the Far East, exclusive of the undesirable low, swampy lands.

The investigators discuss an altitude limitation. A provisional observation would exclue all lands in the American tropics above 1,500 feet. This we believe is very conservative. We know of very excellent rubber estates in Sumatra and Java which lie at a 2,000 feet elevation. A suggestion is made in the report that coffee could be grown as an inter-crop with the rubber at the higher elevations. This practice is common in Java and in parts of Sumatra. The capital costs of opening are thereby greatly reduced, as five or six good crops of coffee are obtained, while the rubber is coming into bearing. Another consideration is that at the higher altitudes population is more dense and labor is cheaper and healthier than in the lowlands.

A further natural limitation is rainfall. Lands having a pronounced dry season are not considered as desirable for rubber growing as those whose rainfall is distributed evenly throughout the year. For this reason the Pacific Coast from southern Mexico to the Gulf of San Miguel in Panama is not so desirable, although soil and temperature are favorable. Owing to the presence of rubber here and there in this coastal strip, the investigators recommend that small experimental areas be tried to determine whether or not rubber would be successful as a seasonal crop. For labor might be shifted to tapping rubber during the rainy seasons in these regions where sugar and other crops are harvested during the dry season.

Production Costs

The success or not of any extensive rubber growing in the Americas is going to be determined by production costs. If these cannot be made as low or possibly lower than in the Middle East, capital cannot be expected to become interested. The outstanding handicap at the present time to successful rubber planting in the Latin-American countries is high labor cost. There is a scarcity of labor in the regions best suited for rubber growing. The only areas of surplus labor that could be drawn upon in or near these regions is in the West Indies. These islands could supply from 30,000 to 40,000 workers. The present scale of wages in the Middle East, including recruiting and hospital charges, is about 35 cents per day for Tamils and a little above 40 cents per day for Chinese. In the low lands of Central America and Mexico the range of daily wages is from $1 to $1.50 a day. In the highlands farm hands receive from 20 to 40 cents per day. The quality of the labor available in these highlands is diligent and intelligent and if it could be induced to migrate to the less healthy regions where rubber would have to be grown, a very favorable factor would be introduced.

It is believed, according to this survey, that the cost of production in America will be around 32 cents per pound, as against 20 cents in the Middle East, at the present time. However, as was pointed out in an earlier issue of this journal[8], an estate with an average cost and with average production in the East would be forced to get a price about 50 cents a pound to bring in a return of 15 per cent on the investment. Hence, the production cost of 20 cents, as given, when added to the capital charges of bringing the estate to the bearing stage will total more nearly around the higher figure of 50 cents. It remains to be seen whether American capital will be willing to risk its money on a tropical venture on a return of less than 15 per cent on its money as British capital has done in the Far East.

Referring to capital charges for bringing an estate to the productive stage in northern tropical America, the report states that, if methods similar to those employed by the banana industry are employed, the Americas are in a better position than the Far East. Thus, while capital costs are lower, production costs are higher and all efforts will have to be centered on reducing the latter. This can be done by increasing the efficiency of the laborer and by introducing labor saving machinery and other things which we know have made the United States laborer, receiving the highest wage in the world, capable of competing with countries of lowest wage. The American laborer produces more than any other laborer, 30 times more than the Chinese, 25 times more than the British Indian, nearly three times more than the French and nearly twice as much as the British. The result is that although the average wage is high in the United States, the cost of work is low. The same economic principle can be adapted probably in tropical America and thus put the factor of production costs on a more favorable basis, as compared with similar costs on far eastern plantations.

General Competitive Factors

Another line of attack in reducing production costs is offered by breeding strains of Hevea rubber trees, which yield more per tree and per acre than the average now obtained in competitive countries. This offers a very real method since, if the yield could be doubled per acre in the Americas, as is practically proven from experiments already quite advanced, costs of production might be lowered to 20 or 25 cents a pound—a level that would offer Americans a good competitive basis after taking all the other important factors into consideration.

Thus far only one serious disease has been reported from the American tropics. It is a leaf disease found in Dutch Guiana. Root diseases and stem diseases are somewhat prevalent and the chances are that some trouble might be had with such in the American tropics, but never to any serious extent.

Health and Sanitation

Considerable advance has been made in introducing modern sanitary practices into northern tropical America. The experience of the United Fruit Co. on its banana plantations shows what can be done to maintain a relatively high degree of health and sanitation in these regions.

Government Stability

Of course, some of the countries have been torn by revolution and others are laboring under heavy financial burdens. The report indicates, however, that broken contracts and losses have been far fewer and less consequential than was to be inferred by the wide publicity given to the few instances that have actually occurred. Export duties on rubber do not exist in any of the countries mentioned in the survey. It is declared that practically all countries would welcome so stable an industry as rubber and investors could hope for the most favored treatment, even to the extent of having existing laws on land tenure modified.

[8] "Cooperative Buying and Restriction," THE INDIA RUBBER WORLD, January 1, 1927, p. 194.

Multiple Time Controller for Presses in Rubber Plants[1]

System for Securing Specific Curing Records—Design, Construction and Operation—Correct Cure of Goods—Efficiency of Production

TIME and temperature control of vulcanizers in rubber work has been practiced for many years. However, it is but little over a year since the successful control of press curing time has been accomplished automatically. The system here described was designed to eliminate the human element as far as possible with reference to the time of curing tire beads. It is, however, applicable to press work on any rubber article and effectually prevents shortening the curing time by the press operator. This frequently occurs in piece work—when the time intervals are regulated by the pressman. Under the new system the presses cannot be opened until the curing period is completed, therefore successive heats are of the same length and there can be no failure or variation of cure.

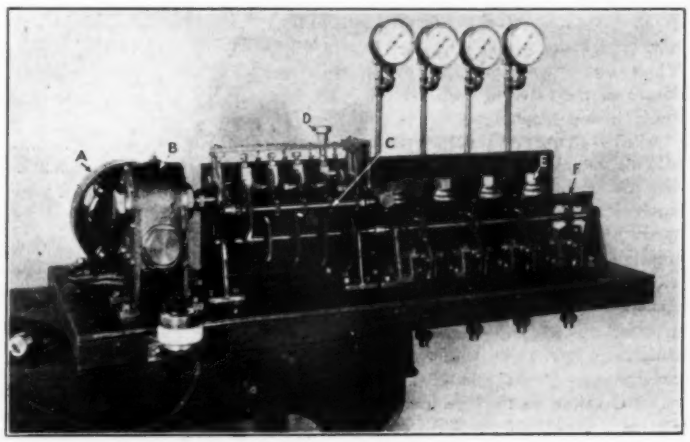


Fig. 1. "T I C" Multiple Time Controller

The multiple timing apparatus pictured in Figure 1 is arranged for automatically closing and opening four presses working independently. All are on the same time cycle or curing period and controlled by a single timing gear. The mechanism is operated electrically and by compressed air. The motor *A* is ⅓ h.p., and operated from a light socket. Its speed is constant at 1,200 r.p.m. This is decreased by the reduction unit *B* which drives a jack shaft *C* at a determined speed. The various time cycles are obtained by gear connections from the jack shaft to the shaft below extending the length of the apparatus. These timing gears are held in mesh by a screw post *D* passing through the plate extending above them. The time cycle or curing period is changed by screwing this post into the opening in the plate above the gear marked for the desired time cycle. Only one cycle can be set in at one adjustment and it is the same for all the presses under control of the system.

At the right in Figure 1 is a row of four air blocks *E*. For each block there is an air cylinder with connection to the compressed air system. The latter carries two pressures, one of 80 to 125 pounds from the main air supply and the other of 20 pounds from a tank shown at the left in Figure 2.

The air block is operated by contact of lever *F*, Figure 1, pressing on the air block valve stem and operating the system of compressed air for opening and closing the presses. The entire action is through the agency of the train of movements outlined above.

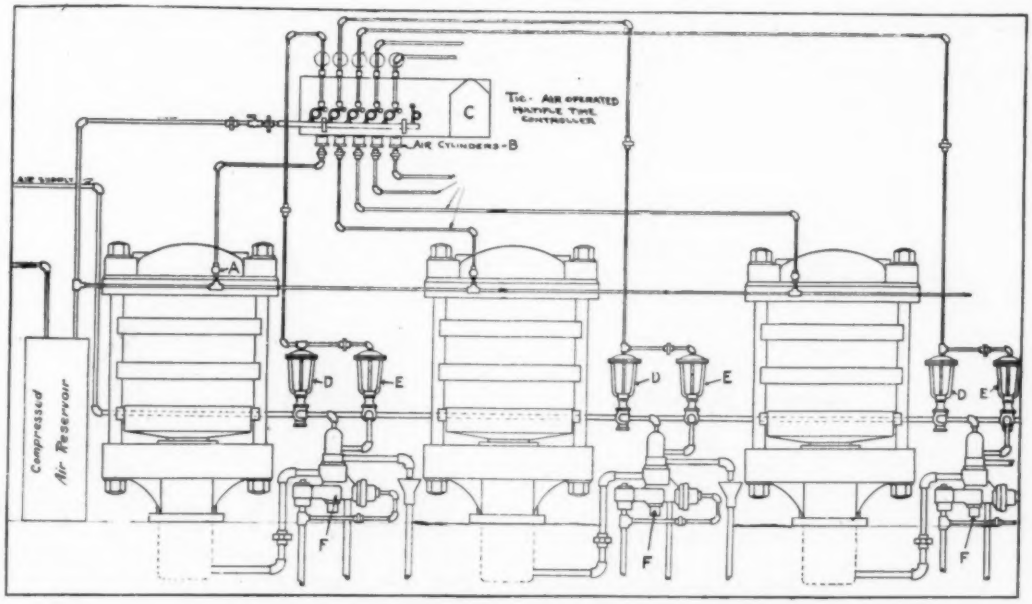


Fig. 2. Schematic Lay-Out of "T I C" Time Control System

[1] By A. B. Hohman, engineer, The Thermo Instrument Co., Akron, O.

The application of the system to a line of three presses is shown in the general schematic arrangement indicated in Figure 2.

Operation

Assuming that the motor is running, and the timing gear is plugged in, the press is opened thus: The push button air valve, *A* in Figure 2, at the top of the press, is snapped inward, which admits low pressure compressed air into the air cylinders *B* forcing up the piston. This movement releases a lever stop under the air block valve stem of the controller *C* which allows the air valve to close. The timing gears are held in mesh for the required time cycle by spring pressure, thereby permitting immediate downward travel of the air cylinder piston after the release of the push button. This is by reason of a small leakage of air at the base of the cylinder. Closure of the valve in the air block cuts off the pressure in the direct action diaphragms of valves marked *D*, causing their mates marked *E* to operate simultaneously. Their dual action opens the hydraulic valves marked *F*, admitting pressure to the press ram, raising it and closing the press.

At completion of the time cycle set the timing gears of the controller are automatically unmeshed. The air block valve opens, admitting compressed air to reverse the action previously described, thus causing the press to open by releasing the hydraulic pressure on the ram.

The desirability of time control for vulcanizing presses is self evident to every rubber works manager, because uniformity of cure is so important a factor in turning out reliable rubber products. The system here described is the first of its kind for curing presses and by actual service has demonstrated its practicability.

The Practical Rubber Chemist

Charles Berlow[1]

A small rubber factory owner recently expressed the view that a chemist is an expensive luxury as he would spend much time and money working on some theoretical subject not directly beneficial to the company. He felt that the larger rubber companies should do all the experimental work. This opinion should be changed and the small manufacturer shown how a practical rubber chemist in the factory can be of valuable assistance.

The following are a few things which he should do:

He should prepare specifications for the materials used in the plant and see that each shipment conforms to them, and thus working hand in hand with the purchasing department, the chemist helps the factory as well as the supplier of raw materials. It is not always necessary to live up too strictly to specifications, and unnecessarily increase the cost of raw materials. It is quite an expensive proposition to reject shipments when a slight adjustment might make the goods useable. The experienced rubber chemist can very often make a minor change in the compound or cure and still get uniform results.

The chemist should assume responsibility for the quality of the finished goods. He must check the charts of cures to see that everything is working properly at the vulcanizers and presses. He should watch the compounders, observe the scale adjustments and by a check-up system know that each batch contains the proper ingredients, especially sulphur and accelerator. The usual method is to run cures and gravities on a certain number of batches each day. He should assume responsibility for all chemical problems that come up. For instance, if the coal does not burn, the chemist must find out why it doesn't. If the varnish on the hot water bottles is not very shiny, it is up to him to make it shine, in short, the chemist is the official trouble man to whom all plant problems are referred.

The rubber chemist is sometimes called upon to investigate customers' complaints and therefore should inform himself on such problems and give technical advice for their solution.

[1] Chief Chemist, American Wringer Co., Woonsocket, Rhode Island.

As he is sometimes called upon to meet the customer personally he must be somewhat of a diplomat and create friendly feeling between factory and customer. This work shows up strongly on the right side of the profit and loss sheet.

Conditions in the rubber industry are always changing and the chemist must keep in touch with the latest developments by reading the current journals and attending the chemical meetings. In some branches of the industry progress is so rapid that the new developments of five years ago may now be obsolete. Many of the accelerators on the market a few years ago have been replaced by more active and better products. The use of ultra-accelerators, antioxidants and rubber latex was not considered practical a few years ago, and dipping uncured stocks into water was considered dangerous practice. The practical rubber chemist must be informed on all such matters and adopt new methods that may be suitable for his own plant.

Personal discussions with salesmen is another way for the chemist to keep in close touch with conditions outside his own plant, and gain much valuable information. As a rule salesmen are more than willing to put themselves out to help by imparting knowledge of important matters. Therefore the practical rubber chemist should never be too busy to take advantage of this source of information.

It is often necessary to change compounds or methods of production, the object being: (1) Improve quality without increasing cost or slowing down production; (2) Speed up production without lowering quality or increasing cost; (3) Lower cost and still maintain quality and production.

These tasks are sometimes difficult and require the chemist to be alert in his study of conditions throughout the plant. He must also watch the market reports on materials and adjust his compounds to take advantage of fluctuations.

In the large plant with a specialist for nearly every department the chemist's time is fully occupied with the laboratory work and he is not bothered with manufacturing problems. However, the practical small plant chemist spends almost as much time in the shop as he does in the laboratory. What spare time he has left must be spent in research and in the development of new products. It is up to the salesmen to develop new markets and to the chemist to develop new products to fill in production in the off season, thus reducing overhead and maintaining profits.

INCREASES IN THE MICRONEX FAMILY

The Binney & Smith Co., 41 East 42nd street, New York, N. Y., specializing in compounding ingredients used in the rubber industry, is meeting with success in sales of two of its newest products:

Mike and His Kid Brothers

Velvetex, a soft carbon; and Stearex, a standardized stearic acid. In other words, "Mike" (Micronex) claims that "the Kid Brothers are growing up!"

The Story of Balata

William P. Earle, Jr.

Sheet Balata

SHEET BALATA comes from the British, French and Dutch Guianas in South America. One of the well-known districts is the Nicherie, situated some distance in from the coast. Another district is the Maroni, which is traversed by the Maroni River in Dutch Guiana. Here the land is high, containing rugged mountains and valleys, extensive savannahs, and plains so fertile that the grasses are ever fresh and green. Ninety miles in from the mouth of this river is the town of Albino. Here canoes and bush negroes are engaged to take the parties up river, which is very dangerous from here on, due to the many rapids and rocks found in the stream.

The Guianas began exporting balata in a small way in 1880, increasing the exports up to 1912, when all three countries were producing in appreciable quantities.

Balata concessions are granted by the government of the Guianas and must be paid for in advance. Prospecting is then done by a party consisting of twenty men and a foreman, each receiving an advance of money. Provisions are provided to keep the men busy for three months. The exploitation consists in marking the number of trees per hectare that can be bled, and then one can tell what to expect more or less from a concession. A concession may consist of 40,000 hectares (400,000 acres), with, say twenty trees to a hectare. Only men with large capital will be granted concessions as the responsibility is very great. With lower market prices, financial advances are harder to obtain and a crop reduction is certain to follow.

Balata trees of all descriptions are found principally in the northern part of South America, between the equator and 12 degrees north latitude, and between 50 degrees and 82 degrees west longitude. The tree has a straight trunk with a dark red wood. The adult tree is 75 feet to 125 feet high, and 4½ feet in diameter. The limbs branch out near the top, thus giving a long trunk for bleeding the latex. The trees require thirty to forty years for maturity, in fact many trees are one hundred years old.

The tree is bled of its latex in the same manner as in Venezuela except that the tree is not cut down but tapped standing. The latex is then poured to spread thinly over large palm leaves or on metal sheets of iron and allowed to dry naturally under shacks provided for this purpose, until the latex has entirely coagulated. It is then separated from its backing, baled, wired under pressure, and bagged ready for the market. The collectors start out in January and return with the harvest in March.

The average quantity taken from all trees during the season of production is said to be four to fifteen pounds of balata per tree, depending on the maturity of the tree for its greatest yield. It will be noticed that the minimum amount collected is about one-quarter the yield from the balata trees in Venezuela.

New Town in Dutch Guiana is the principal balata collecting port. From here the cargo is shipped to Paramaribo on the coast for export.

The analysis of air-dried sheet balata shows the following average percentages:

	Per Cent
Gutta	39 5/10
In Resin	42 2/10
Moisture	6 1/10
Impurities	12 2/10
Total	100

Balata Block

Venezuela balata block originates in the valley of the Orinoco in South America. It is here found and collected in low-lying territory known as the Territorial Delta. The Orinoco River, about one hundred miles in from the sea, is divided into five great channels, which in turn fertilize the heavily forested country, unexplored except by the Indians in search of balata.

The concessions, as in Guiana, are granted by the Venezuelan government, and great care is exercised that those receiving the concessions are financially responsible, and have capital sufficient to fit out the exploring expeditions. With lower market prices, financial advances are harder to obtain and a reduction in the crops is certain to follow.

The collection is made from trees that belong to the Mimusops genus, and is classified botanically as *Mimusops globosa* (Gaertner). These trees grow along the edges of the rivers or channels. The trees in the interior of the forest are not exploited, due to excess of cost of transportation from the forest, also the Indians who do the collecting are lazy, and often cut the trees down. The Indians claim that in place of these trees other trees spring up, which is very doubtful. The collectors start out in January, and return with the harvest by April. A second crop is procured from June to September.

After the trees are felled a row of calabashes is placed alongside of each tree, the bark is scored, and the milk or latex is caught in the calabashes. It is boiled on the spot until it coagulates, and is then pressed and prepared in blocks or planchas. This is the easiest method, and its preparation in this form is largely due to the laziness of the natives. The production of Venezuelan block is over twice that of all the Guianas put together.

San Felix, above Ciudad Bolivar, in Venezuela, is the principal port for balata. At Ciudad Bolivar the blocks or planchas are cut in two by the natives, by means of large knives, and are then examined for purity, and finally graded. The three grades are meaty, seedy, and bluish. The meaty quality is a really prime quality, smooth, and uniformally a light greyish brown color, and quite clean. The seedy quality shows signs of the bark of the tree, being coagulated with the latex. The bluish color is caused by the clay or soil along the bank where the tree has been felled, being mixed with the latex. This mixing is usually done by the collectors through carelessness, or on purpose. A fair average quality is known to contain, roughly speaking, 40 to 50 per cent meaty, 30 to 40 per cent seedy, and the balance bluish. The percentages of each vary with each season's crops.

The planchas are brought to San Felix in small boats or ox-carts over land, and sometimes by porters carrying individual blocks. They are then shipped to the large importing and exporting houses in Ciudad Bolivar. These exporting houses have controlled the output of balata for years without successful foreign competition. The reason for this is that they know the natives very well, speak the Spanish language, and are apparently well liked by the Venezuelan governmental officials, with whom they have been dealing since the first exports of balata in 1896.

PERU AND URUGUAY INCREASE TARIFFS

Through the Peruvian emergency tariff law, effective January 1, 1927, import duties on many classes of goods have been greatly increased. According to *Commerce Reports,* increases amounting to one-quarter of the present rates are provided for pneumatic tires and tubes, solid tires, rubber thread and other manufactures of soft rubber, except shoes of rubber or with rubber soles; on these the rates are increased by one-half.

In Uruguay the new import duties, which became effective November 13, represented an advance of 10 per cent, as applicable to automobiles, automobile chassis, and pneumatic tires in general, the latter class of goods now being subject to an import duty of 55 per cent. There are no changes in the duty on solid rubber tires, now subject to a tax of 45 per cent.

American Rubber Technologists

THOMAS MIDGLEY, *b.* Oct. 1860, London, Eng.; public schools, Worcester, Mass.; time keeper and foreman, Washburn & Moen, Worcester, Mass. 1878-1884; supt. Hartman Steel Co., Beaver Falls, Pa., 1884-1888; designer, wire machinery 1888-1896; supt. Columbus Bicycle Co. 1896-1899; mgr. Midgley Mfg. Co., Columbus, O. 1899-1905; consult. engr. & v. p., Hartford Rubber Works, 1905-1908; consult. engr., Morgan & Wright, Detroit, Mich. 1906-1914; mgr. Midgley Tire Co., Lancaster, O. 1914-1917; consult. engr. and machinery development, Fisk Rubber Co., since 1918. Patented detachable, demountable and universal auto tire rims; tire constructions and tire machinery. *Member*: S. A. E. *Address*: Fisk Rubber Co., Chicopee Falls, Mass.

Roy W. Brown, *b.* July 19, 1891, Bowerstown, O., Findlay Coll. Findlay, O. Mechanic, Graham-Logan Motor Co., Bowling Green O., 1909-1910; mechanic, Hudson Motor Car Co., Detroit, Mich., 1910-1911; engineer, Curtis Lumber Co., Mill City, Oregon, 1911-1913; engineer, C. F. Jackson Co., 1913-1916; marine engineer, U. S. Ship'g. Bd., 1916-1918; Lieut. S. G., U. S. N. R. F., 1918-1919; charge of Engineering Lab., Firestone T. & R. Co., 1919—. *Author:* papers on motor vehicle riding qualities, instrumentation and tests; developed instruments for measuring physical properties of rubber; automatic control apparatus and vulcanizing processes. *Member:* S. A. E., associate, Amer. Chem. Soc. *Address*: 636 Storer ave., Akron, O.

Walter Wood Evans, *b.* Apr. 18, 1888, Kensington, N. H.; Ph. D. Chem. engr. U. of N. H., 1908; U. of Toronto, Can. 1908-1911; research chem. B. F. Goodrich Co., 1911-1913; chief chem. Phila. Rubber Wks. Co., 1913-1915; chem. labs. B. F. Goodrich Co., 1918-1920, development mgr. 1920-1924, director Products Control Div., 1924-1925, tech. supt. Mech. Div., 1925-1927; joined tech. staff R. T. Vanderbilt Co., New York, N. Y. April 1, 1927; *Member*: Amer. Chem. Soc., ex-chairman, Rubber Div., chairman, Akron Section. Am. Inst. Chem. Engr., Mystic Shrine. *Address:* R. T. Vanderbilt Co., 50 East 42nd St., New York, N. Y.

Chris Brokius, *b.* July 25, 1884, Phila, Pa.; A. B. chem. engr., Swathmore Coll. 1910; asst. chem. engr. Underwriters Labs., Inc., Chicago, 1910-1918; asst. chief chem. Manhattan Rubber Mfg. Co., Passaic, N. J. 1918-1924; development mgr. 1924—. Served on technical committees Rubber Asso. of Amer. and A. S. T. M. *Member:* Amer. Chem. Soc.; S. A. E., Knight Templar and Shriner. *Address:* 61 Willett St., Passaic, N. J.

Wilder Emery Perkins, *b.* July 15, 1901, Worcester, Mass.; B. S. mech. eng. M. I. T. 1925; machine designer, Rice Barton & Fales, Inc, Worcester, Mass., 1925-1926; draftsman, Stone & Webster Inc., Boston, Mass. 1926; research engr. Manhattan Rubber Mfg. Co., Passaic, N. J. 1926—. *Member*: Amer. Soc. Mech. Engrs. *Address*: 85 Reid ave., Passaic, N. J.

E. O. Dieterich, *b.* Sept. 7, 1889, Dubuque, Ia. B. A., 1912; M. S., 1914; Ph. D., 1916 U. of Ia.; instructor in physics Ia. State Teachers Coll. 1912; same, U. of Minn. 1915; asst. prof. of physics U. of Ia., 1918; physicist. B. F. Goodrich Co., Akron, O. 1919—. *Author*: Papers on optical, electrical and mechanical properties of selenium; accelerated aging of hard rubber compounds. *Member*: Am. Phys. Soc., Optical Soc. of Amer., Sigma Xi. *Address*: 664 Noble ave., Akron, O.

Everett W. Fuller, *b.* 1892, Brooklyn, N. Y.; B. A. Amherst Coll. 1915; M. A. Columbia U., 1916; 1st Lt. C. W. S. 1917-1918; research associate appl. chem. M. I. T., 1919-1920; private asst. Harvard U., 1921; research chem. Fisk Rubber Co., 1922-1926; Mgr. Prod. Dept., 1926—. *Coauthor:* Papers on organic and physical chemistry; general investigations of accelerators, antioxidants and methods physical testing rubber, etc. *Member:* Amer. Chem. Soc.; Phi Beta Kappa; Phi Lambda Upsilon; Alpha Chi Sigma, and Chi Phi. *Address*: Fisk Rubber Co., Chicopee Falls, Mass.

Philip Lightfoot Wormeley, *b.* Feb. 17, 1878, Richmond, Va.; M. E. and E. E. U. of Va. 1901; engr. New Ams. Gas Co., Long Island City, N. Y., 1901-1902; prof. mech. eng., Coll. of Charleston, Charleston, S. C. 1902-1904; engr. tests U. S. Dept. of Agric., Washington, D. C.; asst. physicist, 1910-1911, asso. physicist, 1911-1921; physicist, chief, Rubber Sect., Bu. Stds., Washington, D. C. 1921—; designer rubber and leather testing machines; patents on water gas generator mechanism. *Author:* govt. pubs. on cement, concrete, std. hose couplings and fittings, rubber and leather testing, automobile tires. *Member:* A. S. T. M., chairman, Tech. Comm. Rub. Prods., packings and gasket materials of Fed. Specif. Bd.; chairman, sect. comm. fire hose, Amer. Eng. Stds. Comm. *Address*: Bu. Stand., Washington, D. C.

THE INDIA RUBBER WORLD'S brief biographies of American rubber technologists are approved by leaders of the rubber industry because the ambition, imagination and practical accomplishments of these men are largely responsible for America's leadership in the world's rubber manufacturing industry. Technical superintendents, chemists, process and development engineers in rubber manufacturing and reclaiming plants, research, testing and service laboratories are invited to send their biographical data to us for publication.

Charles Edgar Maynard, *b.* Jan.13, 1895, Concord, Mass.; B. S. General Scientific Course, Amherst Coll. 1917; equipment engr. Goodyear T. & R. Co., Akron, O., 1917-1918; development work and mgr. Process Development Dept., Fisk Rubber Co., Chicopee Falls, Mass., 1919—; inventor patents relating to tire and inner tube manufacture. *Member:* Phi Kappa Psi, Mason. *Address*: 74 Massasoit street, Northampton, Mass.

James Dinsmore Tew, *b.* May 2, 1882, Jamestown, N. Y.; St. Pauls School, Concord, N. H.; B. S. Harvard U. 1905; supt. Tire Div. B. F. Goodrich Co., Akron, O., 1918-1925; works mgr. 1925—; Inventor various patents and developments on tires. *Address*: Hudson, O.

Seth Roy Clark, *b.* Nov. 18, 1880, Spencer, Mass.; B. S. in chem. Worcester Polytechnic Inst., Worcester, Mass., 1904; chemist, sewage disposal plant, Worcester, Mass. 1904-1905; chf. chem. and technical supt. Republic Rubber Co., Youngstown, O. 1905-1920; genl. supt. Braender Rubber Co., Rutherford, N. J. 1920-1922; compounding development, Fisk Rubber Co., Chicopee Falls, Mass. 1923-1926; mgr. chf. Specif. and Cost. Div. of Product Development, 1926—. *Member*: Masons. *Address*: 19 Albemarle street, Springfield, Mass.

Pierre Amzi Cady, *b.* June 28, 1891, Bloomfield, N. J.; special student in chem., Columbia U.; gen. facty. work, Combination Rubber Mfg. Co., Bloomfield, N. J., 1910-1915; development work, Rare Metals Products Co., Belleview, N. J., 1915; chf. chem. Hodgman Rubber Co., Tuckahoe, N. Y., 1915-1916; asst. mgr. mill and calender depts., Manhattan Rubber Mfg. Co., Passaic, N. J., 1916-1920; mgr. same depts. 1920-1926; mgr. factory research, 1926—. *Address*: 96 Park ave., Passaic, N. J.

John C. Sproul, *b.* 1878, Ohio; honorman, B. S. in mech. eng. 1905, M. E., 1912, Rose Polytechnic Inst; banker Ansonia, O., 1898-1900; exper. engr. J. T. Case T. M. Co, Racine, Wis. 1905-1907; asso. prof. mech. eng., Carnegie Inst. Tech., Pittsburgh, Pa. 1907-1919; consulting engr., Pittsburgh, Pa. 1912-1919. *Member*: Federal Fuel Administration for Pa. during war; engr. tests and dept. mgr. B. F. Goodrich Co., Akron, O. 1919—. *Author*: technical papers; patents; reports to Pittsburgh Ind. Devel. Comm. *Member*: A. S. M. E., S. A. E., honorary member N. A. S. E., Committees of Rubber Asso. of Amer., Mason, K. of P., Franklin Club, Akron, O. *Address*: 397 Woodland ave., Akron, O.

Walter E. Shively, *b.* Nov. 28, 1892, Cleveland, O.; East Tech. High Sch., Cleveland, O.; Webb Inst. Marine Eng. and Naval Arch., New York, N. Y., 1915; Tire Design Dept., Goodyear T. & R. Co., Akron, O. *Address:* 520 Aqueduct street, Akron, O.

Rhys D. Evans, *b.* Sept. 17, 1888, Athens O.; A.B. Ohio U. 1909; Grad. Sch., Harvard U., 1911-1914; physics instructor, Harvard U. 1912-1915; asst. prof. physics, Bowdoin Coll., Brunswick, Me., 1915-1918; Capt. C.W.S. U. S. A., 1918-1919; research physicist, the Goodyear T. & R. Co., 1919.—*Member*: Delta Theta Delta, Amer. Phys. Soc., Franklin Club, Akron, O. *Address:* 813 Weber avenue, Akron, O.

Abel Martin Hamblet, *b.* Feb. 25, 1881, Salem, Mass.; S.B. in chem. M. I. T. 1902; Chem. Bower Fertilizer Co., 1902; Chem. Oxford Paper Co., 1903-1907; chem engr., The Whiting Co., 1907-1015; mfg. chem. 1915-1921; various positions with Goodyear T. & R. Co., Akron, O. since 1922; present position mgr. of research. *Member:* Amer. Chem. Soc., Akron University Club, Akron, O.

What the Rubber Chemists Are Doing

Alternating Behavior of Fatty Acids[1]

W. H. Smith and C. E. Boone[2]

THE procedure and results of this important investigation are from the paper by the authors.

The normal straight chain fatty acids from formic to stearic, inclusive, have been studied to determine their relative properties as accelerators when used in connection with zinc oxide in rubber compounds. The effect of the phenyl fatty acids, benzoic, phenylacetic and hydrocinnamic acids, has also been determined. The purity of the acids was ascertained by deteminations of the melting point, boiling point, and density. When necessary, acids which did not conform to accepted standards for purity were purified until satisfactory agreement was obtained.

The fatty acids were added to blanket or rolled brown crepe and pale crepe. Sufficient quantities of each type of rubber were reserved exclusively for this work. The blanket crepe was used in a compound containing 100 parts of rubber, 10 parts of sulphur, and 5 parts of zinc oxide. The compound employed with pale crepe contained 100 parts of rubber, 7 parts of sulphur, and 5 parts of zinc oxide. Molar proportions of the acids were used, 1/15 mol with each 1,000 grams of rubber. A master batch of the base compounds was prepared and the correct proportion of the acid thoroughly incorporated on an experimental rubber mill. The use of molar proportions of acid conforms to the recommendations of Kratz, Flower, and Coolidge that comparisons of organic accelerators should be made with molecularly equivalent amounts of the substances in question.

The compounds were cured in slab form in sheets approximately 1/16-inch thick, using aluminum molds. The time of cure was varied by 10-minute increments from an undercured to an overcured compound. Tests of tensile strength were made 24 hours after vulcanization according to the method described by the Bureau

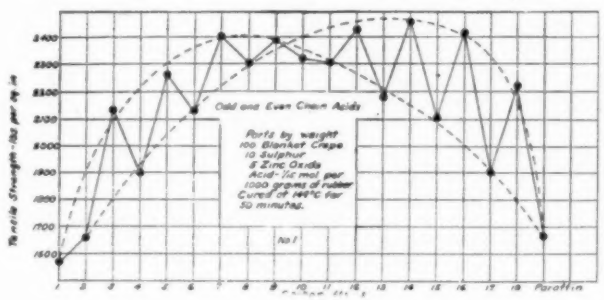


Fig. 1.—Effect of Fatty Acids on Blanket Crepe

of Standards Circular No. 232. The results represent an average of three determinations of tensile strength. It was found that the alternating behavior of the acids was most evident in blanket crepe at a 50-minute cure and in pale crepe at a 40-minute cure. The tensile strength at break was determined as a measure of the condition existing at the end of these periods. No relation was found between elongation at break and the number of carbon atoms in the acids. The values for elongation at break were higher in the first four members of the series of fatty acids and dropped uniformly to a fairly constant value in acids with a carbon content higher than butyric.

[1] *Indus. Eng. Chem.*, Mar., 1927. 398-399.
[2] National Bureau of Standards, Washington, D. C.

The results are shown in graphic form. In Figure 1 tensile strength at break is plotted against increasing carbon content of the entire series of fatty acids compounded with blanket crepe. The effect is a series of alternating, jagged breaks. Dotted lines drawn through the points for the acids with an odd number of carbon atoms and those with an even number, respectively, give two smooth curves. The maximum tensile strengths of compounds containing acids with 3, 5, 7, and 9 carbon atoms are greater than the strength of compounds containing acids with one more or one less carbon atom, up to C_{10}. The relation is reversed in compounds containing acids with 11, 13, 15, and 17 carbon atoms in comparison

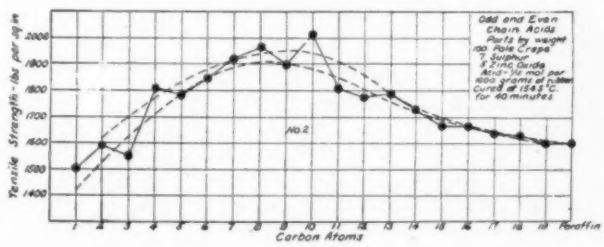


Fig. 2.—Effect of Fatty Acids on Pale Crepe

with those containing acids with 12, 14, 16, and 18 carbon atoms. The effect of paraffin, as shown in the graph, is decidedly less than that of the higher fatty acids, which may indicate that the presence of the hydrocarbon chain in the acids is not the significant factor in determining their effects.

Figure 2 shows the effect of the odd and even acids on the tensile strength of the second compound in which pale crepe was used. The alternating character of the effect of the acids is evident, but is less marked than with blanket crepe. For lower members of the series the even, rather than the odd, numbered acids, give the greater values of the tensile strength. The curves for the odd and even numbered acids practically merge above acids of 14 carbon atoms.

The difference in behavior of the two kinds of rubber when treated with fatty acids is presumably due to the difference in kind and proportion of acids which they originally contain. Blanket crepe, since it is relatively poor in fatty acids, allows full scope for the influence of added acids, and shows to a marked extent their alternating property. In pale crepe, on the other hand, the fatty acids already present overshadow, but do not completely mask, the influence of added fatty acids.

Interpreting Tests of Crude Rubbers

The following interesting discussion on the difficulties of interpretation of results in crude rubber testing is condensed from the report of the Raw Rubber Specifications Committee, Sept. 10, 1926.

Chemical Properties

ASH. The ash apparently represents more or less extraneous ingredients with no specific effect on the properties.

ACETONE EXTRACT. The greatest significance of the acetone extract lies in the character and quantity of each of its ingredients rather than in the total amount present. Therefore, until more is known concerning the effect of these ingredients, determination of the total acetone extract is of little significance in explaining the variations in crude rubber.

WATER EXTRACT. In sprayed rubber, all of the original substances

dissolved in the latex are retained and the water extract will run about 7 to 9 per cent. While these substances probably account in large measure for many of the characteristics of sprayed rubber, we need to know the constituents rather than the total.

NITROGEN. A simple nitrogen determination is of no significance. The nitrogenous products of decomposition are important but their determination is difficult and their action and effect not entirely clear.

ACID NUMBER. The acetone extract of rubber consists partly of certain organic acids. The term "acid number" denotes the number of milligrams of potassium hydroxide required to neutralize the acid thus obtained from 100 grams of rubber. There may be some relationship between the acid number of a rubber and its quality but the present available data are insufficient to warrant the use of the acid determination.

Physical Properties

TENSILE. Since rubber compounds are seldom used where the prime property brought into play is resistance to rupture when stretched to the breaking point, this determination serves as a means of measuring other properties such as abrasion or tear which are more difficult to determine. In general, we associate high tensile strength with high quality. There is a general tendency to talk loosely about quality of crude rubber on no other basis than this, which does not take into consideration the uses in which the tensile and related properties are of little use or significance. We can probably assume the connection between high tensile and high associated properties for such uses as tire treads, and specify as high a tensile in a given recipe as good practice shows it possible to obtain in any given grade of rubber.

As to the recipe, the fact that the tensile relationship of a series of crude rubbers will vary with the recipe used is generally recognized. Until we know more about the constituents of the rubber which cause this difference of action we see no other way than that of testing in a number of different recipes, the number depending on the completeness of the examination. It is necessary to be very cautious in extending the significance of the test beyond the recipe used, certainly it should be limited to very similar recipes. With this in mind the significance of individual recipes requires little explanation and this list should be made up either from types based on individual practice or from types based on representative procedure. It is apparent that in order to show the effect of any ingredient it is necessary to use a formula employing that ingredient in amounts corresponding to accepted practice.

RATE OF CURE. The main interest in this property is in uniformity. While no one would want extremely slow curing rubber there is on the other hand a limit to the extent to which very fast curing rubber would be acceptable. Possibly an agreement could be reached to maintain the rate of cure at somewhere near the present average.

CONSISTENCY. The significance of this test is in its indication of milling properties in the factory. It is also an indication of the history of the rubber during preparation. A further possible significance is that it is a measure of toughness in the cured state. Just how important this may be is open to some question, first because of lack of data, and second because in practice it is necessary to reduce the rubber to a certain state in order to incorporate the fillers and process the compound.

VISCOSITY. This determination is probably of more significance as an indication of the cement making properties of the rubber than it is of its toughness or workability. The committee knows of no work sufficiently accurate or complete to warrant interpretation of ordinary viscosity determinations in terms of quality of ordinary cements.

TEAR RESISTANCE. There are two things involved in this test, first, whether or not the results of any of the present methods for measuring the resistance compare with that type of service where actual tearing of the article as a whole occurs, and second, whether or not resistance to tear is involved in other types of service where testing as such is not apparent. An example of the latter is in abrasion service where possibly the abrasion is partly made up of the tearing away of minute particles. In any case high resistance to tear is an indication of high quality.

ABRASION RESISTANCE. When once the methods for this test are determined the problem of interpretation of results is quite easily solved at least insofar as dealing with those types of service where abrasion is a factor. The only difficulty here arises from the fact that the relative resistance to abrasion of two or more stocks varies with the type of abrasion to which they are submitted. What must be emphasized is the fact that abrasion results can only be interpreted in terms of one very particular type of service and one type of abrasive surface. The most we can hope to do is to have a test which will indicate the relative value of different kinds of rubbers or compounds for a particular service and kind of surface. It will be necessary to vary the test to show the true relationship for another set of conditions.

Another factor in interpreting abrasion tests is the fact that the results may be increased at the expense of some other properties. This point has not been mentioned in connection with the other tests but it is recognized of course that these various properties of the vulcanized rubber go through progressive changes with the state of cure and do not all reach the optimum at the same position in the range. This, however, is of no serious consequence in interpreting results as, so far as we know, all rubbers behave alike in this respect.

Rubber Research Problems

Dr. William C. Geer refers as follows to the need of research in the rubber industry.[1]

Research problems in the field of rubber chemistry have had but little attention in the university centers, perhaps due to the need of vulcanization and physical test as the final proof of value. Such testing requires some small machinery. If, however, chemists would realize that such machinery is simple and not expensive, they may be led into studies in a field at once fascinating because of its complexity, and possibly productive on account of its industrial applications. Let me remark as a suggestion to any who may take up such studies for the first time that they test or vulcanize new materials only in well standardized simple formulas. The following are a few of the many problems upon which light is needed.

1. A precise determination of the Joule effect by modern methods and upon standard mixtures.

2. What is the precise part played by different dry mineral powders in the rubber mixtures? We know the effect pretty well but not the cause.

3. Studies in abrasion. Why do different compositions wear away at different rates?

4. The composition of the latex particle along the line of Hauser's work should be undertaken with especial reference to the effect of mastication upon structure. A good deal of work has been done but more is needed in order to reach final conclusions.

5. The X-ray studies of structure are significant but are disputed in certain circles. A more extended study would be worth while.

6. A major problem is to answer the question, "Why is rubber elastic?" Is there an elastic structure of the rubber molecule?

7. Polymerization catalysts of isoprene and butadiene into rubber would throw light on the chemical nature of rubber.

8. The problem of oxidation of vulcanized rubber needs study and accelerated aging tests need to be brought to a scientific basis.

9. The theory of vulcanization is an ever present problem of vast extent and with many ramifications.

10. The physical constants of crude rubber and of typical mixtures would add to our knowledge.

11. Allied to the theory of vulcanization is the reversal of it. Can sulphur be removed? It is the reclaiming problem in its scientific aspects.

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[1] "A Survey of American Chemistry," Vol. 1, 175.

A. C. S. Rubber Division Meeting

The spring meeting of the Rubber Division of the American Chemical Society will take place in connection with the seventy-third general meeting of the society to be held at Richmond, Virginia.

The Rubber Division will hold its sessions Wednesday afternoon April 13, and Thursday morning, April 14, also on Thursday afternoon if necessary. An entertainment and smoker will be held Thursday evening.

PROGRAM

Wednesday Afternoon, April 13

1. "Electro-Plating of Rubber: Colloidal Galvanoplasty."—S. Szegvari.

2. "The Conversion of Rubber into Thermoplastic Products with Properties similar to Gutta Percha, Balata and Shellac. Part I. Methods of Preparation and General Properties."—Harry L. Fisher.

3. "The Conversion of Rubber into Thermoplastic Products with Properties Similar to Gutta Percha, Balata and Shellac. Part II. The Chemistry of the Reaction."—Harry L. Fisher and Eugene M. McColm.

4. "The Determination of the Rubber Hydrocarbon in Vulcanized Rubbers by the Kemp-Wijs Method."—Harry L. Fisher and A. E. Gray.

5. "The Chemical Unsaturation of Rubbers Vulcanized with Poly-nitro Compounds and Benzoyl Peroxide, and its Possible Bearing on the Nature of Vulcanization."—Harry L. Fisher and A. E. Gray.

6. "The Effect of Temperature on the Tensile of Reclaimed Rubber."—Henry F. Palmer.

Thursday Morning, April 14

7. Report of the Physical Testing Committee.

8. Discussion of the distributed report of the Raw Rubber Specifications Committee.

9. "Seven Years' Experience with a Mill Room Testing Laboratory."—R. M. Warner.

10. "The Measurement of the Abrasion Resistance of Rubber and some Relations between Abrasion and Tread Wear."—Ira Williams.

11. "Some Accelerator Characteristics as Revealed by Coefficients of Vulcanization."—A. F. Hardman and Frank L. White.

12. "Isolation of Natural Oxidation Inhibitors of Crude Hevea Rubber."—H. A. Bruson, L. B. Sebrell and W. W. Vogt.

Thursday Evening

Details of the Rubber Division Smoker available at time of the meeting.

Rubber Division Research

The Raw Rubber Specifications Committee of the Rubber Division has submitted its report in printed form and been dismissed. The Physical Testing Committee is conducting privately financed cooperative researches at the Bureau of Standards.

It is proposed to investigate the effect of variations in temperature and relative humidity on the stress-strain and tensile properties of vulcanized rubber. The expense is to be shared by the six members of the committee other than the Bureau. It is proposed to try this arrangement by first determining the effect of the above variables during the period between curing and testing. If this is successful a study will be made of the effect of these variables in the period between mixing and curing, and then during mixing. The object is to obtain the information necessary to recommend standard conditions for the preparation and testing of samples.

The rubber compounds used have been prepared and vulcanized under carefully controlled conditions in order to eliminate all variables that might affect the results. The experimental work is being carried on in a constant-temperature room with thermostatic control which permits tests to be made over a temperature range between +4.4° C. (40° F.) and +43.3° C. (110° F.). Samples for test are stored in cabinets which are maintained under atmospheric conditions varying from 0 to 100 per cent relative humidity.

Chemical Patents

United States

1,617,411. METHOD OF VULCANIZATION. A compound or mixture of metallic oxide, sulphur and an organic accelerator is applied by dusting to the surface of a sheet or piece of rubber and then subjecting the rubber to heat.—Thomas W. Miller, assignor to The Faultless Rubber Co., both of Ashland, Ohio.

1,617,495. COMBINING CELLULOSE AND RUBBER. A colloidal combination of cellulose and rubber is formed by submitting a mechanical mixture of rubber containing cellulosic substance to steam in the presence of enough alkali to activate the cellulose. The excess of alkali is then removed, the mass is treated with acid to form hydrocellulose, washed free of acid and dried.—Sidney A. Ogden, Los Angeles, California.

1,619,938. PRESERVING LATEX AND PRODUCT. The latex is treated with an organic antiseptic and an alkaline phosphate.—Alfred E. Jury, Rutherford, New Jersey, and Omar H. Smith, New York, N. Y., assignors to General Rubber Co., New York, N. Y.

1,619,964. LUBRICATING OIL. One gallon lubricating oil with one fluid ounce of a mixture comprising one ounce of rubber cement, five ounces of gasoline and 24 ounces of lubricating oil.—Joseph F. Anderson, Kansas City, Kansas.

Dominion of Canada

268,515. PLASTIC COMPOSITION. A composition of matter comprising resol, a filler of rubber and a coloring matter.—Carl Kulas, Leipzig, Germany.

268,726. RUBBER MANUFACTURE. The process for producing a compounded mass from reversible latex paste of a vegetable resin, such as caoutchouc latex, that is a paste-like product which can be reconverted into the original latex without losing its colloidal properties. To this pasty product is gradually added compounding ingredients under such conditions that the latex does not lose its reversible properties. There is thus produced a foamy paste which is submitted to a drying process.—K. D. P., Ltd., London, E. C. 3, England, assignee of Ernest A. Hauser, Frankfort, Germany.

268,772. ASPHALT, ETC. A process of manufacturing solid or liquid substances, including asphalt and rubber, brought into the form of an emulsion or suspension, after which they are coagulated in the presence of relatively small quantities of one or more finely divided substances.—Frank R. Moser, Amsterdam, and Naamlooze Venootschap; De Bataafsche Petroleum Maatschappij, The Hague, assignee of half interest, both of Holland.

268,922. THIAZOLE PRODUCTION. A method of preparing mercaptothiazoles that comprises causing an ortho-nitro-halide material to react with a basic sulphide in the presence of carbon bisulphide and hydrogen sulphide.—The Goodyear Tire & Rubber Co., assignee of Lorin B. Sebrell and Jan Teppema, all of Akron, Ohio.

United Kingdom

262,487.† TREATING LATEX. Fillers are incorporated in untreated stabilized, thickened or vulcanized caoutchouc or like latex without coagulation by the addition of equivalent amounts of soluble materials which react and precipitate solid products in the latex.—K. D. P., Ltd., 7 Gracechurch street, London, assignee of Metallbank & Metallengische Ges., 45 Bockenheimer Aulage, Frankfort, Germany.

263,028. PLASTIC COMPOSITIONS. A composition suitable for spraying roads, for protecting iron, wood, etc., and as a roofing material by boiling together 70 parts of rubber and 30 parts of bitumen.—J. Campbell, 379 St. Vincent street, Glasgow, Scotland.

263,517 ACCELERATORS. Materials for use as accelerators of vulcanization are produced by the interaction of formaldehyde with the condensation product of amine.—E. C. R. Marks, 57 Lincoln's Inn Fields, London (E. I. Du Pont de Nemours & Co., Wilmington, Delaware, U. S. A.).

263,714. TIRES. The wearing qualities of a pneumatic or solid tire are increased by coating the tread surfaces with resinous material in alcohol, linseed oil or other solvent before vulcanization.—J. R. Darling, 537 Via Del Palma, Whittier, California, U. S. A.

†Not yet accepted.

Germany

439,980 Method of producing rubber with a large number of microscopically small pores. Addition to patent No. 425,770. Dr. Hermann Beckmann, Albertinenstrasse. 26, Berlin, Zehlendorf.

440,122 Method of improving the properties of gutta percha, balata and the like and mixings thereof. Felten & Guilleaume Carlswerk A.-G., Köln-Mulheim.

440,179 Method of producing rubber dental plates. Christe Joannides, Constantinople, Turkey. Represented by, Richard Linde, Mauerstrasse 81, Berlin.

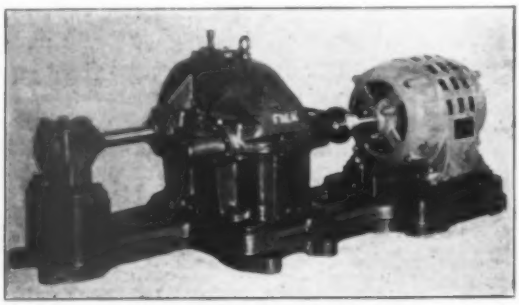
STOPCOCK GREASE

An effective lubricant for use on glassware stopcocks of laboratory apparatus consists of vaseline 16 parts, crude rubber 8 parts, paraffin 1 part. These ingredients are melted all together. More paraffin may be added to increase the stiffness of the mixture.—M. J. Bradley and H. E. Wilson, *Ind. & Eng. Chem.*, Dec., 1926, 1279.

New Machines and Appliances

Speed Reduction Drive

THE accompanying illustration represents a new line of speed reducers. These units feature the Falk continuous tooth, all steel herring-bone gears, precision made, silent and highly efficient. The special design of the housing eliminates all external ribs, projections or complicated cores. Thus the lubrication has been simplified and all possibility has been removed of dirt or core sand working into the gearing. Air plane type of



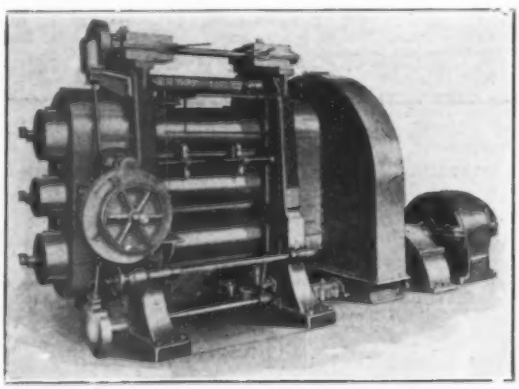
Falk Double Speed Reducer

steel-backed babbitted bearings used are capable of carrying heavy loads. The lubrication is by an improved automatic system. Standardization of units and motor beds has been effected in accordance with general industrial demands, making possible their stock delivery.

These reducers are built in three types, single reduction for ratios up to 9 to 1, double reduction for ratios up to 70 to 1, and triple reduction for ratios up to 300 to 1.—The Falk Corporation, Milwaukee, Wisconsin.

Combination Rubber Calender

The three-roll combination motor-driven calender here depicted is one of the latest developments in rubber working machinery of this type. At every point it is safeguarded by devices to prevent possible injury to the calender crew and to lighten their work in



Thropp Combination Motor-Driven Calender

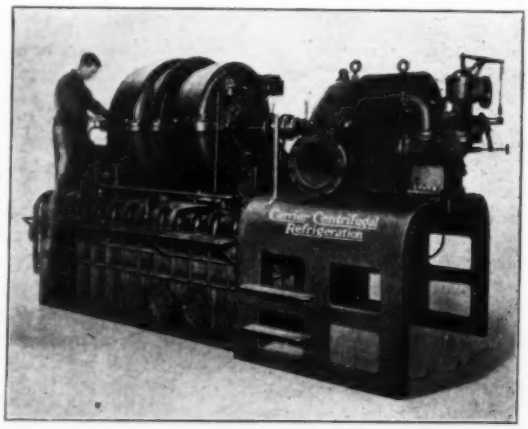
the matter of adjusting the massive rolls. Thus all gears are thoroughly guarded. The machine is equipped with dynamic braking safety stop, operated by cross bars in front of the rolls and by cables along the sides of the frames. This is for the protection of the operator should he be caught in the take-ups or between the rolls.

A patented motor device for raising and lowering the rolls is operated by a foot push button switch. The drive from motor to calender is of the latest type having a flexible coupling between motor and jack shaft. The pinion is forged on the shaft, turned and herring-bone cut. The large gear is of open hearth steel turned and similarly cut. Both gears are enclosed in an oil tight guard and all bearings are ring oiling.—W. R. Thropp Sons' Co., Trenton, New Jersey.

Mechanical Water Cooling System

Although new to the rubber industry, the machine here pictured has been applied for several years in other industries where automatic and accurate regulation of cold water temperature is essential and under conditions of variable load. The new powerful rubber mixing units are good examples of this kind of cooling load in the rubber industry.

The machine is a complete cooling system in which the entire refrigerating cycle occurs within the self contained unit, involving no external condensers and no additional expansion or Baudelot coils. It is of the centrifugal type and the only contact parts are the two main bearings lubricated under sufficient pressure to float



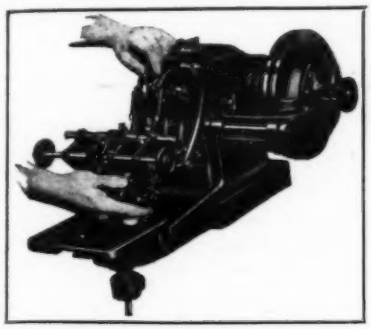
Carrier Centrifugal Refrigerating Machine

the shaft. There are no pistons, valves or other reciprocating parts, which means an absence of all sliding friction and freedom from vibration.

A characteristic of this machine is that the interior remains free from any oil film and also free from air or any gases which may lower the efficiency of the refrigerating cycle. This feature, with lack of wear, means high efficiency during an exceptionally long life. The ability which is inherent with centrifugal apparatus, to balance the power demand and work done, combined with automatic water temperature control, makes the system 100 per cent automatic in operation. A uniform water temperature is automatically maintained even with a cooling load ranging between zero and maximum within a short time.

Since the entire refrigeration cycle occurs in a partial vacuum, there is no outward leakage of refrigerant. The refrigerating medium, dielene, is a stable harmless liquid which may be carried in an open pail. There is no fire nor explosion hazard and the contents of a large machine could be discharged into a small enclosed space without serious discomfort to employes.—Carrier Engineering Corp., 39 Cortlandt street, New York, N. Y.

Inner Sole Marking Machine



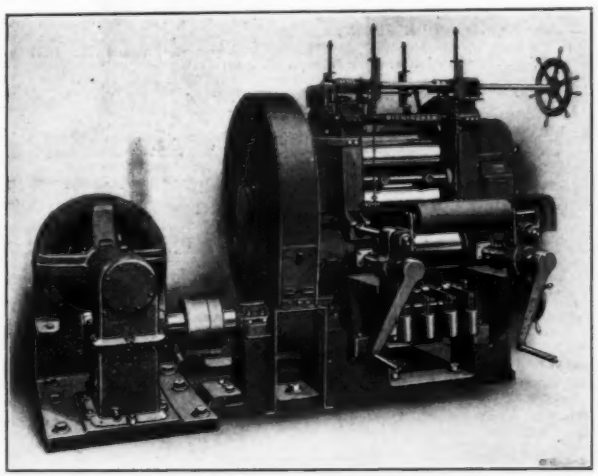
Markem "Universal" Marker

The illustration pictures a small machine adapted for marking inner soles with brand names, and size numbers. It is one of a line of bench and pedestal machines for a wide range of similar work in factories of many sorts. The equipment is without gears or cams, free from vibrations and practically noiseless. It imprints materials impossible to other machines with one, two or three lines. The printing head is removable by simply loosening one knurled set screw. The inks used with this machine are especially made to adapt them to the material to be printed upon.—Markem Machine Co., 232 Summer street, Boston, Massachusetts.

Tread Calender

The accompanying illustration pictures a motor driven calender of special design for running tire treads. With such a machine the same profile can be used for all different compounds as long as the shape and size of the tire tread is ultimately the same. The gage is set simply by adjusting the side roll of the calender in or out.

This tread calender has three chilled iron rolls arranged in a vertical stack with a steel side roll against the bottom roll. The



Birmingham Tread Calender

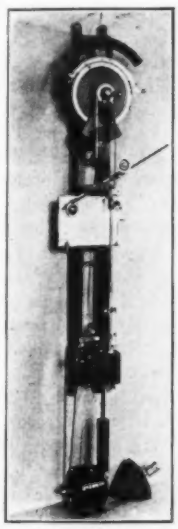
side roll is constructed as a hollow steel core fitted with a stuffing box, for steam circulation, and a cut gear. Separate sleeves fitting over this steel core carry the different tread profiles. The sleeves are readily interchanged, however, when changes of profile are called for.

The usual method of operating the calender is to feed the rubber between the top and middle roll on the same side as the profile roll and take it off the latter on to a conveyer belt or apron where it is cut to lengths and placed in books. In front of the rolls adjustable knives are provided to trim the edges of the treads as run.

By equipping this calender with stock and friction gears and removing the side roll it may be used as a regular three-roll calender for running inner tube and other stocks.—Birmingham Iron Foundry, Derby, Connecticut.

Improved Single Strand Tester

The power testing machine here pictured is designed for recording tests of plied yarns, tire cords, etc. The machine is mounted on heavy cast-iron rails ensuring great rigidity and freedom from vibration. Its capacity is either 25 or 50 pounds interchangeable by removing one weight from the head and substituting another in place of the first. This is easily done as the weights are held in position by a large wing nut.



Scott Tester

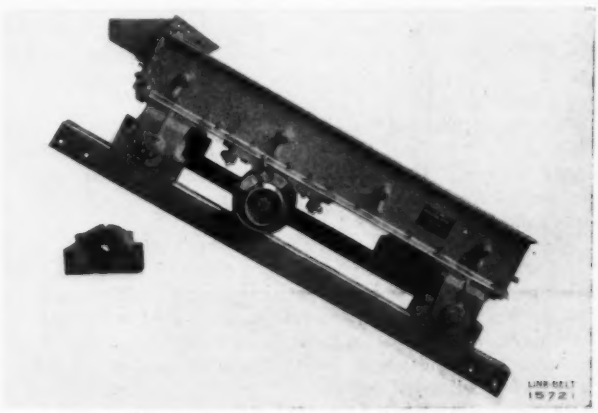
The machine is provided with a double dial so that computation is unnecessary. The recorder is arranged to show in two inches of its movement, one inch of stretch in the sample, thus giving a magnified graph. For example, in testing automobile tire cord, of the usual construction, and using the 25 pound capacity of the machine, the recorder draws a line about 7½ to 8 inches in length, showing exactly the movement of the cord under tension.

The movements of the tester being exaggerated and the graph produced being correspondingly enlarged, the apparatus is specially adapted for research work as well as for routine testing. The dimensions of the machine permit long samples to be used. Extensions are supplied for the clamps so that it is possible to hold specimens from 2 to 20 inches in length between the jaws.—Henry L. Scott Co., Providence, Rhode Island.

New Vibrating Screen

Screening machines are very desirable equipment for rubber compounding rooms especially in plants making insulation or high grade goods, such as may be damaged by the presence of coarse particles of any sort in the rubber mixing. In the preparation of ground stock for reclaiming work such screens are very essential equipment.

The illustration represents a new ball-bearing vibrating screen of simple construction requiring minimum upkeep expense. It is



Link-Belt Ball Bearing Vibrating Screen

adaptable to practically all fine screening conditions. As a mechanical device it is reduced to the simplest possible mechanism, namely, one moving part which rotates in oversize ball bearings. The vibrator has no cams, springs, striking blocks or levers to adjust or renew. It is simply a power-driven shaft thrown out of balance by adjustable counterweights. This shaft imparts vibrations to the screen box on which it is mounted, these are transmitted

to the screen cloth secured, under tension, in the box. Binders or clamp plates are placed upon fine mesh cloths for protection against tearing and for tightening it to desired tension. These clamp plates serve also to clamp the cloth to its deck, eliminate wear of the screen box side frames, and prevent leakage along the side edges. A longitudinal vibrator strip assists the screening action by imparting raps to the cloth. The latter are used of standard width. The machine has a feed box attached to the receiving end of the screen, vibrates with it, controls the feed and spreads the material uniformly over the screening surface. An automatic regulating gate makes it easy to receive a non-uniform feed, practically adds two feet to the effective length of the screen and obviates the use of mechanical distributers.—Link-Belt Co., 910 South Michigan avenue, Chicago, Illinois.

Rubber Slicing Shear

The need for an efficient and easily operated power knife or shear for cutting up compressed masses of crude rubber has caused several machines to be designed for this purpose. One of the latest of these is here pictured. This shear is of the guillotine type, hydraulically operated and designed to slice baled smoked sheets parallel to the plane of the sheets. It also shears crepe rubber or any other material of similar nature. The knife has an angle or rake along the cutting edge, with another bevel parallel to and away from the cutting edge. The thickness of the knife is sufficient to push the cut slice away from the bale, and to produce tension in the rubber along the cutting point so that the knife will make a clean cut.

Southwark Rubber Shear

The plunger operating the knife head is mounted on top of two substantial side housings and is actuated by a three-way valve connected to the top of the plunger; the bottom of the plunger being under constant pressure. The valve mechanism is such that at the finish of the cut the knife head is brought to rest by a cushioning effect on the under side of the piston. On the return of the piston to its extreme upper position the same action takes place automatically, thus avoiding any direct contact stop between piston and cylinder. In conjunction with the knife head and operated by it is a hold down gripper having plain conical prongs. The initial movement of the knife head releases the hold down and pushes the prongs into the bale of rubber before the knife starts to cut.

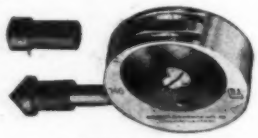
The bale is fed under the knife by a horizontal plunger provided with prongs which grip the last slice and prevent it from being pulled away as the slice ahead is being cut. The thickness of slice is controlled by the plunger movement governed by a four-way valve. A bale of irregular shape is held by a side clamp operated by a hand wheel. When this clamp is used the bale is held on four sides and one end.

This machine will slice bales 18 by 18 by 24 inches at the rate of 6 slices per minute, of thickness suitable for feeding into mixer rolls. The shear will cut slices 1½ inches thick and upward. The slice shown in front of the machine was cut from a bale of smoked sheet rubber 18 by 18 by 24 inches and is 1½ inches thick.—Southwark Foundry & Machine Co., Philadelphia, Pennsylvania.

SPAIN'S IMPORTATIONS OF AMERICAN-MADE TIRES AND TUBES HAVE shown the following advances in recent years: 1923, $411,665; 1924, $280,404; 1925, $573,138, and 1926, $883,796.

Pocket Speed Indicator

The vest pocket tool here pictured is most convenient for checking shafting speed and mantaining the r. p. m. of machines. It has but four major parts, all simple and rugged of construction. There are no delicate adjustments to get out of order. The instrument, set to zero, is held with the thumb directly on the small dent in its side and the rubber point applied to the center of the wheel or shaft whose revolutions are to be determined. Every 100 revolutions the steel plate lifts under the thumb, therefore, counting the lefts for one minute gives the hundreds of revolutions. The r. p. m. in either direction are then obtained by adding to the number of 100 revolutions the reading in units of five which appears in the slot at the top of the tool. If the r. p. m. are less than 100, the reading in the opening will give the revolutions direct. The tool is provided with two interchangeable rubber points to fit hollow or flat surfaces.—Brown & Sharpe Manufacturing Co., Providence, Rhode Island.



Speed Counter

Process Patents

United States

1,617,588 Composite product. William C. Geer, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,617,604 Fabric for corset, brassiere and the like. Ernest R. Mills and Carl J. Hazelton, Worcester, Massachusetts.

1,617,707 Laminated material. William C. Geer, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,618,823 Tire construction. James E. Hale, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,619,023 Composite sole for boot or shoe. Benjamin F. Hartwell, Winchester, Massachusetts.

1,619,119 Inner tubes. Horace Hillyard Hastings, Quebec, Canada.

1,619,359 Variegated articles. Tod J. Mell, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,619,428 Brushes. Hugh P. McMillan, assignor to Samuel M. Dell & Co., Inc., both of Baltimore, Maryland.

Dominion of Canada

268,710 Rubberized fabric. The Dominion Rubber Co., Ltd., Montreal, Quebec, assignee of Hector Vivian Lough, Hartford, Connecticut, U. S. A.

United Kingdom

263,571 Forms for concrete. J. A. Rice, 1165 Arch street, Berkeley, California.

Germany

440,856 Producing rubber with designs. Herbert Frood, Walter Richard Sydee and Ferodo Limited, Chapel-en-le-Frith, England. Represented by, Hans Heimann, Berlin, S. W. 61.

440,857 Process and apparatus for producing rubberized fiber stuffs. Ernest Hopkinson, New York, and Morgan & Wright, Detroit, United States. Represented by, R. H. Korn, Berlin, S. W. 11.

441,021 Rubberizing fabric. Continental-Caoutchouc-und Gutta-Percha-Compagnie, Hannover.

Machinery Patents

Dominion of Canada

268,712 Assembling machine. The Dominion Rubber Co., Ltd., Montreal, Quebec, assignee of Charles Wurtenberg, Union City, Connecticut, U. S. A.

268,764, 268,765 Apparatus for tire manufacture. The Yoder-Morris Co., assignee of Howard I Morris, both of Cleveland, Ohio, U. S. A.

268,781 Airbag apparatus. The Goodyear Tire & Rubber Co., assignee of Richard Stuart Burdette, both of Akron, Ohio, U. S. A.

268,921 Bead setter.. The Goodyear Tire & Rubber Co., assignee of Ross E. Jenkinson, both of Akron, Ohio, U. S. A.

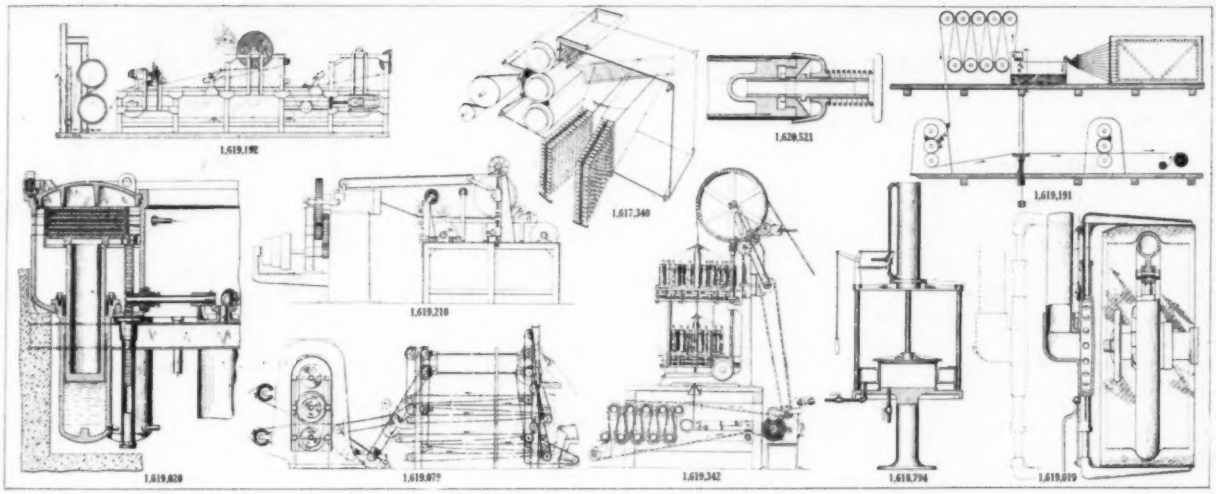
268,923 Humidifier. The Goodyear Tire & Rubber Co., assignee of Harold A. Brittain, both of Akron, Ohio, U. S. A.

268,924 Cementing device. The Goodyear Tire & Rubber Co., assignee of Laurence Wetmore, both of Akron, Ohio, U. S. A.

268,925 Breaker applying device. The Goodyear Tire & Rubber Co., assignee of Dayton L. Williams, both of Akron, Ohio, U. S. A.

268,926 Bead turning machine. The Goodyear Tire & Rubber Co., assignee of Dayton L. Williams, Both of Akron, Ohio, U. S. A.

268,964 Crimping bead flipper. The Utility Manufacturing Co., Cudahy, assignee of Edward Hutchins, Milwaukee, both in Wisconsin, U. S. A.



United States

1,617,340. PREPARING RUBBER COATED FABRICS. Cords are drawn from a creel through a comb and device for spacing them into sheet form. They are then conducted by a series of tension and driving rolls and pass successively between the upper and middle and lower and middle rolls of a 3-roll calender fed with rubber on both sides. In this way the cord sheet is coated with rubber at a single passage through the calender.—Colin Macbeth, Four Oaks and Wallace J. Dexter, Erdington, Birmingham, England, assignors to Dunlop Tire & Rubber Co. of America, Buffalo, N. Y.

1,618,794. APPARATUS FOR MANUFACTURING TIRE CASINGS. This invention provides a means whereby a pulley band tire is distended by air pressure placing it into sealed engagement with the edges of a vacuum chamber. The casing is then completely shaped under vacuum after which a vulcanizing bag is introduced and the casing cured in a mold.—Adrian O. Abbott, Jr., assignor to Morgan & Wright, both of Detroit, Michigan.

1,619,019. TIRE BUILDING METHOD AND APPARATUS. This device quickly and accurately places a tire band upon a building core and preserves uniform tension throughout the circumference of the band. This result is accomplished by drawing the tire band into position around the building core by vacuum.—John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,619,020. APPARATUS FOR VULCANIZING STRIP MATERIAL. This is designed to vulcanize hose, etc., in long lengths simultaneously and uniformly throughout its entire structure. The hose or strip material is coiled in annular two-part molds which are stacked on annular platens of an hydraulic press ram within a vertical cylindrical vulcanizer. The hydraulic ram holds the stack of molds closed against the cover of the vulcanizer.—John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,619,079. METHOD AND APPARATUS FOR PREPARING PLASTIC STOCK. The apparatus comprises a stock cooling mechanism designed to receive plied uncured hard rubber sheeted stock from a calender. This mechanism cools and conveys it to storage after slitting it into longitudinal and transverse strips with skived edges. This system eliminates storage in liners, shortens the time of cooling, omits much hand labor and delivers cut units with edges skived cross-wise of the calendered sheet.—Charles W. Leguillon, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,619,191. MANUFACTURE OF WEFTLESS CORD FABRIC. Cords are arranged in spaced parallel relation out of contact with each other and impregnated with a penetrating and binding solution of rubber. They are then brought into contact with each other for removal of the excess liquid and again separated for drying. Finally the cords are arranged in the spacing desired for the fabric to be made by application of rubber coatings on each side by calenders.—Martin Castricum, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,619,192. DELIVERING MOVING WEBS. This is a method and a mechanism for picking up the leading end of a sheet of rubberized web fabric and starting it into a wind-up device.—Martin Castricum, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,619,210. APPARATUS FOR FORMING ARTICLES FROM SHEETS OF MATERIAL. This is a combination tubing and cutting machine. From the former, plastic material is extruded in strips which are conveyed to the cutting machine where it is pressed against dies that cut the articles from the plastic strip, the uncut remainder of which being automatically returned to the tubing machine for reextrusion as a strip.—Alfred A. MacLaren, Boston, Massachusetts.

1,619,342. METHOD AND APPARATUS FOR PRODUCING ELASTIC STRIP MATERIAL. This apparatus is especially adapted for braiding a covering of threads on a rubber core structure while the latter is in a stretched condition, so that the braided covering will limit the elongation and contraction of the strip to a certain definite range. Structures of this sort are of special value as a shock absorber for the landing gear of an airplane.—John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,620,521. APPARATUS FOR THE MANUFACTURE OF RUBBER TUBES. This device forms bevel edges on the ends of mandrel made inner tubes. It comprises a reinforcing plug in the end of the mandrel into which is screwed an annular cutting piece upon which a cap can be compressed by the action of a hand wheel and spring. The effect of this compression is to form a bevel edge on the end of the inner tube at the annular cutting member.—John Dalgish, Birmingham, England, assignor to Dunlop Tire & Rubber Co. of America, Buffalo, N. Y.

1,617,511 Method of cutting sponge rubber. Burdge M. Balch, assignor to The Miller Rubber Co., both of Akron, Ohio.
1,617,705 Tire making machine. Harold A. Denmire, assignor to The General Tire & Rubber Co., both of Akron, Ohio.
1,617,758 Apparatus for examining vehicle tires. Henry C. Heynemann, San Francisco, California.
1,617,829 Tire repair vulcanizer. Herbert K. Wheelock, Akron, Ohio.
1,618,131 Tire bead building drum. Emil Schnedarek, Akron, assignor to The Falls Rubber Co., Cuyahoga Falls, both in Ohio.
1,618,153 Collapsible tire building form. Frank L. Johnson, Akron, Ohio.
1,618,406 Pneumatic tube vulcanizer. Robert M. Brundidge, Cleburne, Texas.
1,618,619 Dumbbell bolt. Job J. Williams, Milwaukee, Wisconsin, assignor to The Fisk Rubber Co., Chicopee Falls, Massachusetts.
1,618,631 Machine for coating webs with adhesive. August M. Becker, New York, N. Y.
1,618,993 Auxiliary tool holder for lathes. Joseph E. Perrault, assignor to Hood Rubber Co., both of Watertown, Massachusetts.
1,619,075 Washer feeding apparatus. Waldemar D. Kmentt, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
1,619,102 Bead mold. Charles H. Desautels, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.
1,619,231 Repair vulcanizer. Achille A. Raffetti, Chicago, Illinois.
1,619,354 Method and apparatus for making and applying markers for rubber articles. Frank J. MacDonald, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
1,619,377 Tire building apparatus. Merle C. Scrote, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
1,619,383 Overinflation preventing apparatus. Charles G. Tiefel, Rochester, New York.
1,619,510 Multiple heater control. Howard A. Hands, assignor to Hood Rubber Co., both of Watertown, Massachusetts.
1,620,092 Cord tire machine. William G. Fording, Cleveland, Ohio.
1,620,435 Air bag. Richard S. Burdette, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.
1,620,499 Tire machine. Edwin G. Templeton, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.
1,620,597 Repair vulcanizer. Paul Francois Marc Albert Fontana, assignor to Societe des Appareils Mephisto Jules Manfredi & Cie., both of Cluses, France.

United Kingdom

262,570 Device for beveling ends of a tube. Dunlop Rubber Co., Ltd., 1, Albany street, Regent's Park, London, and J. Dalglish, Fort Dunlop, Erdington, Birmingham.
262,724† Device for making emulsions. G. Baume, 14 Avenue du President Wilson, Paris, P. Chambige, 54 Avenue Clemenceau, Nanterre, Seine, and D. Boutier, 67 Boulevard de Picpus, Paris, all in France.
262,743† Device for making tire fabric. Soc. Du Latex, 21 Rue de la Station, Alfortville, Seine, France.
263,636 Apparatus for testing hardness of materials. Dunlop Rubber Co., Ltd., 1 Albany street, Regent's Park, London, and T. B. Caldwell, Fort Dunlop, Erdington, Birmingham.
263,359 Stationary cutter. L. Mellersh-Jackson, 28, Southampton Buildings, London (H. E. Wills, North Brookfield, Massachusetts, U. S. A.).
263,457 Lubricating device. H. G. Williams, and R. R. James, Chequers Bridge, Gloucester.
263,636 Apparatus for testing hardness of materials. Dunlop Rubber Co., Ltd., 1 Albany street, London, and E. Simpson, Fort Dunlop, Erdington, Birmingham.

† Not yet accepted.

Germany

440,017 Horizontal press with dipping container. M. Häusser, Maschinenfabrik, Neustadt a. d. Haardt.
440,073 Dipping Apparatus. Addition to Patent No. 397,918. Ernst Hurlbrink, Bachstrasse 2, Berlin.
440,914 Deflating inner tubes. Continental Caoutchouc-und Gutta-Percha-Compagnie, Hannover.
441,157 Device for attaching rubber tread patches. Bruno Grohmann, Kronprinzenplatz 7, Dresden-Löbtau.

New Goods and Specialties

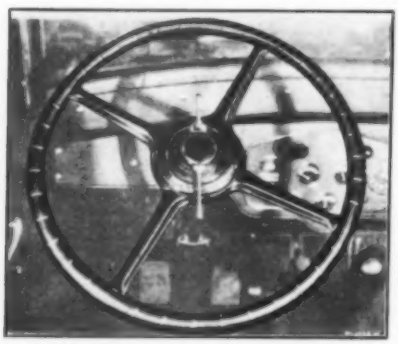
Hat Protector

SUDDEN and unexpected showers need do no damage to the new spring bonnet, providing its owner has tucked away in her bag a Rainy Daysee hat protector designed for just such an emergency. The protector is folded in a bright colored envelope, and may be released by turning the envelope inside out and gently pulling. It is then drawn over the hat, any excess at the bottom being tucked up, while at the top it is drawn to one side giving the effect of drapery decidedly chic and becoming. When not in use the protector may be carried in the handbag.—Evernu Rubber Heel Corporation, New York, N. Y.

Rainy Daysee

Steering Wheel

A special feature of the new LaSalle car, recently announced by General Motors Corporation, Detroit, Michigan, is the rubber composition steering wheel. The wheel is eighteen inches in diameter and is reinforced by a steel core, with hub and spokes of aluminum die cast. Because of the resiliency of the rubber rim, road shocks are greatly reduced. The small



Rubber Composition Wheel

ridges molded in the rubber facilitate handling, providing a firm, steady grip.

Aeroboard

A new rubber product is now offered for light construction purposes. The material is a rubber lumber called Aeroboard. It has a stiff, spongy center faced with a hard skin on each side. It floats freely, having an apparent gravity less than unity. It is being used experimentally in the construction of speed boats, pontoons and airplane fusilages. The new material can be worked practically the same as wood. When heated to the temperature of boiling water it can be formed to difficult shapes which it retains when cooled without loss of tensile strength. It can be attached to frames with nails or screws without danger of splitting. It absorbs less than one per cent of moisture when immersed in water maintained at 70 degrees F, for seven weeks which naturally recommends it for light boat building. Production of aeroboard will soon be undertaken on a commercial scale.—The B. F. Goodrich Co., Akron, Ohio.

New Rubber Dolls

Proof of the popularity of rubber dolls and animals is supplied by the number of new designs making their appearance to delight the grown up as well as the small child. The illustration shows the small Romeo and Juliet, accompanied by the faithful Bonzo, a group manufactured by Hannoversche Gummiwerke "Excelsior," Aktien Gesellschaft, Hannover-Limmer, Germany. These dolls are made of the finest Para rubber, beautifully painted in colors which permit of frequent necessary washings without injury or danger of running. The American rights to the dolls are held by the Hanover Rubber Works, whose sole distributer in the United States, is George Borgfeld & Co., 16th street and Irving place, New York.

Juliet

Bonzo

Romeo

Bathing Float

Timid swimmers gain in confidence when girdled with this new float which is an invention of Ben Di Lauro of Akron, Ohio. It has been pronounced ideal for beginners and is designed to keep the body afloat without in any way hampering

Swimming Device

perfect freedom of action while swimming. The float fits over the back with fabric and rubber straps which buckle in front with a patented clasp. It is claimed that the device will hold the swimmer on the surface of the water under all conditions. The float is manufactured by the Rubber Products Co., Barberton, Ohio.

Sponge Rubber Upholstery

A new type of sponge rubber upholstery substitutes strips and sheets of purest sponge rubber for the usual springs or hair, assuring a cushion of unusual comfort and resiliency. The general appearance of the cushion is similar to an ordinary spring cushion, a thin layer of wool or hair usually being added at the top and bottom of the rubber stuffing and the whole encased in the usual tick or cover. A number of air vents is provided at the sides and ends, a sanitary feature of great value.

In connection with this upholstery an important use, which has been favorably reported on by leading medical authorities, is in the making of mattresses, particularly for invalids. It can be easily cleaned after illness, is germ resisting and, as insects cannot live in rubber, all risk of vermin is eliminated. Each end of the mattress is provided with ventilation holes so constructed that fresh air passes through the entire length whenever pressure is relaxed. The mattress is not affected by the heat of the body and holds it comfortably in

Bull. R. G. A.

Rubber Cushion

whatever position it might assume, instantly regaining its normal level as soon as pressure is removed.

Rubber Bumper

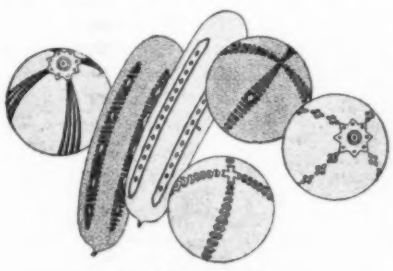
A rubber buffer bar which is in no way unsightly, but conforms with and enhances the general appearance of the car, and may be fitted to the front or rear of any make auto. The rubber is capable of withstanding any shock, and gives a semi-pneumatic

Buffer Bar

cushioning effect. It is made of a special compound which is unaffected by climatic conditions. The channel which holds the rubber is made of flexible steel, the rubber covering preventing rust and saving polishing. No fittings are required, the device merely slipping over the existing bar.—J. W. & T. Connolly, Ltd., 57-67 Wharfdale Road, No. 1, London, England.

Printed Balloons

An attractive new series of printed balloons has just been announced by The Oak Rubber Co., Ravenna, Ohio, under the name of Assorted Striped Prints. They greatly enhance the appearance and popularity of the striped ballons introduced by this company last year, the new series in-



Assorted Striped Prints

cluding a splendid assortment of stripes of different design, giving the line greater flash. The stripes are printed in bright colors, running from the top to the neck of the balloon, and finished at the top with a star or similar decoration. These balloons are furnished in both round and airship styles.

Mohawk Cushion Tire

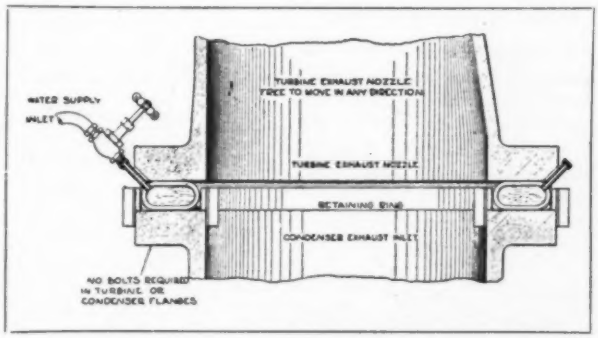
Under actual road test, the Mohawk cushion tires show a great saving in power as a result of the double cushion of air which rolls constantly and continuously between load and road; for the same reason they start with the application of less power. The tire is so constructed that the broad, deep non-skid tread is underlaid

Cross Section View

throughout its entire circumference with an unbroken parallel file of tubular air cavities which extend obliquely through the tire from side to side and are so spaced that each cavity projects past the ends of two others thus continuously interposing the full double cushioning ability between the load and road shock at all times. That the tire fills a real economic need is evidenced by the hearty welcome accorded it by operators of light, speedy delivery trucks in all parts of the country.—The Mohawk Rubber Co., Akron, Ohio.

Expansion Gasket

A simple type of hydraulic or pneumatic expansion gasket requiring no flange bolting has been developed for making a turbine exhaust nozzle joint. This gasket is made of high temperature steam hose or tubing and has two small inlets for the introduction of water under pressure. As pictured in the drawing, the gasket is mounted between the faced and unbolted flanged surfaces of the turbine exhaust nozzle and the condenser inlet nozzle. It will permit of expansion in any amount and in any direction that occurs in practice without submitting the turbine casing or the condenser shell to any induced stresses. The gasket is adaptable to a pipe section of any shape. Experience has shown that a tube 3½ inches in diameter will probably meet all conditions, but the gasket may be made larger or smaller to meet special conditions.—The Dennis Engineering Co., Columbus, Ohio.


WATER SUPPLY INLET
TURBINE EXHAUST NOZZLE FREE TO MOVE IN ANY DIRECTION
TURBINE EXHAUST NOZZLE
RETAINING RING
CONDENSER EXHAUST INLET
NO BOLTS REQUIRED IN TURBINE OR CONDENSER FLANGES

Sectional View of Expansion Gasket Installed

Rubber Tired Steel Wheel

These rubber tired steel wheels, pressed-on type, are made to the S.A.E. standards and are developed in three classes—the industrial, the truck and the trailer. The rubber is vulcanized on a special steel base properly prepared for the application.

It has been found that rubber tires on factory trucks and inside tractors not only materially reduce wear on the equipment but eliminate noise and serious damage to flooring. In depots and warehouses heavy baggage trucks take new lease on life and cost less for depreciation of equipment and buildings when rubber tired, these wheels also preserving tractors which nowadays are moved through the streets at greater

Security Wheel

speed than ever before. Rapid deterioration of portable conveyers, concrete mixers, or portable cranes can be safeguarded against by using the Security rubber tired steel wheels.—The Geneva Metal Wheel Co., Geneva, Ohio.

Tire Boot

Said to be very effective, and of unusual design, is the Rocky Mountain Tire Boot. It is made in all sizes of prime rubberized material, wing-shaped, and wraps twice about an inner tube so as to give extra protection to both tube and casing. It requires no cement and is said to neither creep nor cause bulging in high pressure or balloon tires. Over 250,000 are said to

be in use. Manufactured by the Burrow Manufacturing Co., Spokane, Washington.

Record for Balloon Tires

Silvertown Balloon

Through the adoption of new principles of design in its product, The B. F. Goodrich Co., Akron, Ohio, claims that the Goodrich Silvertown balloon is surpassing the mileage records of tires of high pressure design. One of the problems confronting tire engineers when balloon tires were first developed was to design a properly balanced tread, the balloon tire being a low pressure tire flattens out, putting the weight on the "shoulder" or two outer sides of the tread. Meeting this problem of tread design will stop the waste of millions of dollars worth of tire mileage for motorists, eliminating "cupping" or rapid uneven tread wear—the great cause of short life in balloon tires. Goodrich officials claim that their engineers concentrated on this problem immediately following the inception of the balloon idea, which is the reason for the exceptional mileage made by Silvertown balloons, which have been in use for almost two years.

Mask Protector

As a defense against air borne contagion, Dejermer, the breath of life protector, is positive in its action and can be worn continually or occasionally without discomfort. It is simple in construction, sanitary and easily adjusted. It is especially desirable for doctors, nurses, housekeepers or any one coming in contact with any disease or poison that can be absorbed into the system through breathing. For factory purposes it insures protection against contagion and infection, its simple adjustment appealing to busy workers. The elastic is placed around the neck and the mask adjusted to fit the face.—Hudson Laboratories, 22 Washington Place, New York, N. Y.

Dejermer

Convertible Body Top

A convertible type of body, known as the Aerable monobloc, permits of converting either a two door or a four door closed car into an open car in a very short time. The design provides for a joint between the top and rear quarter unit and the structural part of the body, this unit is made of any well known top material and its edge is supplied with a bead formed by folding the material around a fabric or other cord. A rubber channel is run around the edge of the structural part, the bead of the top and rear quarter filling the groove in this channel when in position. The lips of the channel lie close to the fabric, forming a neat joint. The vehicle may be converted into an open car with little effort by simply pulling the bead out of the channel. This body top has been developed by Emile Alin, Paris, France, represented in the United States by E. E. Lehwess, 341 West 45th street, New York, N. Y.

New Tire Tread Design

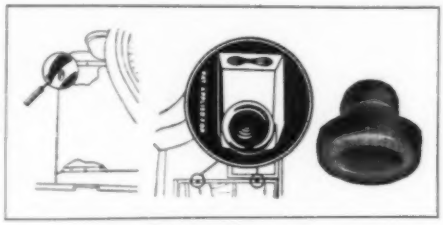
Following the trend of the times in the development of properly designed treads for

Semi-Flat Tread

four-ply balloon tires, the McClaren Rubber Co., Charlotte, North Carolina, has added a new number to its line, a section of which is shown in the accompanying illustration. The tread of this tire is semi-flat, having the distribution of the rubber so scientifically placed as to eliminate uneven tread wear at varying pressures.

Devices to Eliminate Car Noises

To eliminate noise and rattling various devices are offered by the Jorgensen Specialty Co., Erie, Pennsylvania. The door silencers are provided with a vacuum cup which absorbs the shock of closing doors and absolutely saves window breakage, eliminating the necessity of frequent replacement. They are made of high grade, non-blooming stock, held in place by the suction of two air cushions at one side. The hood silencer for Fords can be put on in a minute by slipping over the bead of the hood, where it fits snugly in place and forms a lively rubber cushion between the edge of the hood and the sill on which the hood rests. The Josco snap buttons are instantly installed and will fit any car, outwearing, so the manufacturer claims, the old type of lacing. From two to four dozen are required for a car, and in replacement only those buttons showing wear need be renewed.

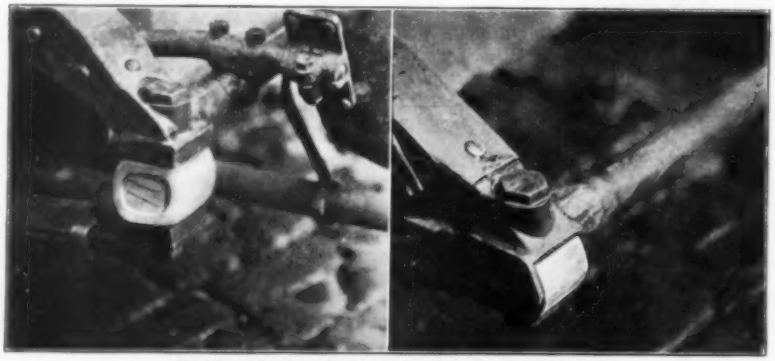


Rubber Silencers

Rubber Mountings

The use of rubber spring mountings on motor trucks and buses has been so successful in contributing to ease of riding and prolonging the life of the steel springs that the same idea is being applied to passenger automobiles.

In the illustration are shown special rubber spring mountings, as used on the front and rear springs of a passenger car. Rubber blocks, of the same form as used in the front spring support, are placed as resilient cushions for carrying the engine upon the frame. The success of rubber thus used is dependent on the development of specially tough resilient compositions, having maximum ability to absorb energy. The same piece of rubber can function at the same time, both to absorb large displacements and is used in that way in bumpers of all It is therefore ideal as a shock absorber, and is used in that way in bumpers of all sorts and is finding increasing use in automotive engineering.—The United States Rubber Co., 1790 Broadway, New York, N. Y.



Rubber Spring Mountings for Automobiles

The Future Rubber Position

David M. Figart

So long as the Stevenson restriction scheme exists it is impossible to compile reasonably accurate statistics very long in advance. The best one can do is to make certain generalities on the position and recite the various influences which may be brought to bear from time to time.

Unless a sharp and sustained rise in the price of rubber takes place shortly, which seems improbable, the amount of rubber exportable from British Colonies will be reduced to 60 per cent of standard production during the third and fourth restriction quarters of this year—May to November. It seems likely that with plenty of rubber in sight for the time being, a fairly stable price will be maintained which may result in an increase in consumption over last year. The year 1927 may end with world stocks approximately the same as at the beginning of the year—a comfortable position, no more. World consumption of rubber may then be at a rate which would justify an early resumption of full production from the restricted British Colonies—100 per cent of standard, instead of 60 per cent.

Provided there is no alteration in the restriction scheme, and provided estates actually restrict their production, as well as their export to 60 per cent, the inevitable result will be a temporary shortage, followed by a rapid advance in price such as we experienced in 1925. For, under the Stevenson scheme, no increase from 60 per cent is allowed: (a) unless the price averages 1 shilling, 9 pence (42 cents) for nine months—much too slow an adjustment; (b) unless an average of 2 shillings (48 cents) is maintained for three months, in which event a modest 10 per cent increase in exports is allowed; or (c) unless the price averages 3 shillings (72 cents) for three months, in which case the exportable percentage is raised from 60 to 100.

If one assumes that the American buying organization has acquired a reserve supply of crude rubber as an insurance against an emergency like 1925, it may be faced with a dilemma. If the organization draws on its reserve as the shortage makes itself felt, the price will be kept below the level at which more rubber would be released from British sources. But if the combine decides that greater releases are absolutely essential, it will not dare to use its reserve supply, as it must allow a period of temporarily high prices to prevail in order that greater releases will be made. In such an event the buying organization would face an inevitable and probably disastrous inventory loss on its reserve.

It is idle for supporters of restriction to argue that this situation should be met by artificially raising prices now, so that greater releases will be forthcoming some months hence. When the quantity of rubber already on the market is so great that prices are depressed below the level fixed by the Stevenson Committee at which fresh releases will be made, raising prices artificially simply will throw still more rubber on the market, which will obviously depress prices further and result in absolutely certain inventory losses.

Supporters of restriction will probably grant this, but will point out that buyers should be willing to face temporary inventory losses in order to insure future supplies. Here, however, they are asking buyers to take an unreasonable gamble. What, for example, will be the non-British production of rubber in the near future? Will British-controlled estates restricted to an export of 60 per cent produce only 60 per cent, or will they produce and store above the 60 per cent limit because of labor and other conditions? Will standard production in 1928 be so drastically increased as to nullify the effect of the 60 per cent clause? Will the various governments continue restriction after the expiration of the present year in view of the growing realization of its effect in transferring supremacy to the Dutch, and in steadily curtailing consumption and stifling new uses? With all these uncertainties the tying up of huge sums of money in crude rubber is fraught with grave danger.

Briefly, if restriction is continued unmodified in 1928, rubber at $1 a pound is a distinct possibility. If restriction is removed, rubber at 25 cents a pound is a distinct possibility. In the face of an inflexible and unworkable scheme which throws all responsibility on one side of an industry without giving it corresponding power, how can a middle course be steered?

Provided no general industrial depression occurs in America, this year should be a good year for the rubber manufacturing industry. But the violent fluctuations in the price of crude rubber which may be experienced again next year will probably result in a repetition of the customary balance sheets where inventory losses wipe out manufacturing profits. What is the final answer to these repeated inventory losses in a raw material under foreign control?

NOTE.—The above article is Mr. Figart's answer to the Editor's request for an opinion on the future status of crude rubber.

A Unique Locomotive Battery

In the successful operation of a new type of storage battery operated locomotive in the Chicago freight yards of the Chicago & Northwestern Railway, and the fact that such an electric dummy engine had also been driven on its own power from Erie to Chicago, makers of hard rubber storage battery cells see the need in the near future of a considerable quantity of such products. The advent of the automobile gave the first great impulse to the making of hard rubber battery cells, the development of radio marked another big stride forward, and now there is reason to believe that the making of the improved electric locomotive as a self-contained unit, such as that in Chicago, will mark the next important step in battery cell manufacture.

The locomotive, made by the General Electric Co., is the largest of its kind ever built in this country, weighing 110 tons, and carries its own power plant, consisting of a 39-ton storage battery and an auxiliary gas engine which can insure continuous operation for twenty-four hours. Having the capacity to give when needed a great rush of power, it can quickly bring a heavy train, even of 3,000 tons, up to speed, or to start and run at eight to ten miles an hour sixty 80-ton cars, thus quickening switching operations and effecting many economics. The first considerable use of the new locomotive will be in railroad terminals in large cities where the cost and complications incident to overhead or third-rail equipment make such installation prohibitive, or where operation with steam locomotives would be objectionable or too expensive. It is expected that means will be found later to adapt such hauling engines for the transportation of freight and passenger trains over long distances.

The battery is the Exide Iron-Clad type FL-31 and its 120 cell jars and their covers are made of hard rubber compound. Each cell contains fifteen positive and sixteen negative plates and is thirty-eight inches high. A unique feature of the battery is the positive plate. It has a grid composed of numerous parallel vertical metal rods united integrally to horizontal top and bottom frames, the usual connecting lug being provided on the top. Each vertical rod forms a core which is surrounded with a cylindrical pencil of peroxide of lead, the active material; and this in turn is inclosed with a hard rubber tube having many horizontal slits. This slotted arrangement provides access for the acidulated water, or electrolyte, to the lead compound, but the slitting is so fine as to prevent the material from being washed out.

A sheathing of rubber on the top edge of every negative plate makes internal short-circuiting practically impossible and thus lengthens battery life.

THE PIRELLI ORGANIZATION, MILAN, ITALY, MANUFACTURER OF many classes of rubber goods, has just completed, according to the Department of Commerce, the building of a new cable between Italy and Spain, the Italcable Co. linking the town of Anzio (near Rome) to Barcelona, a distance of 510 nautical miles. The work was completed in five days.

Editor's Book Table

"Applied X-Rays." By George L. Clark, McGraw-Hill Book Co., Inc., 370 Seventh avenue, New York, N. Y., 1927. Cloth, 255 pages, 6 x 9 inches. Illustrated. Indexed.

IN this book the author is highly successful in imparting to his readers a clear conception of the value of X-rays as a new "tool" for industry. He tells what this new tool is, what results it produces, why it can be applied to practical problems of daily life and how it is being applied in industry.

The book is divided into three parts: (1) fundamentals of X-ray science; (2) direct effects and applications of X-radiations; (3) X-ray analysis of the ultimate structures of materials.

In a chapter on the study of colloidal and amorphous structure the author takes up rubber, balata and gutta percha. The former is shown to be amorphous in its normal state and exhibiting a fibrous structure on stretching, whether raw, vulcanized or compounded. Balata and gutta percha, unlike rubber, are found to be distinctly crystalline in their normal structure. Research men in all industrial fields are indebted to the author for this excellent text book.

"Report of Raw Rubber Specifications Committee." September 10, 1926. Paper, 24 pages, 6 by 9 inches.

This report, which continued the work of an earlier one, is issued by the Executive Committee of the Rubber Division of the American Chemical Society. The report shows that it is practically impossible to formulate raw rubber specifications owing to the lack of standard procedures and lack of check between different laboratories or the same laboratory on the same procedure. The difficulty of interpretation of results is discussed. The committee recommends that test procedures be standardized and extended. Also that studies be made with the object of interpreting specific quality for given purposes in terms of the physical and chemical properties, particularly of the crude material before compounding or curing. There are four appendices to the report; first on such methods as apply to crude rubber; second on sampling; third on definitions of grade, and fourth a bibliography.

"Possibilities of Rubber Production in Northern Tropical America." Trade Promotion Series, No. 40, Crude Rubber Survey, United States Department of Commerce. By John Treadwell, special agent, C. Reed Hill, assistant, Department of Commerce, and H. H. Bennett, soil scientist, Department of Agriculture. Paper, 375 pages, 5¾ by 9 inches. Illustrations and maps.

This is the sixth of a series of publications issued by the United States Department of Commerce and deals comprehensively with the rubber planting possibilities in northern tropical America. The survey covered 21 Latin-American countries, all of which, with the exception of parts of Colombia and Ecuador, lie north of the equator. The purpose of this report as with others of this series on crude rubber is to furnish basic information to persons who may wish to invest in new rubber plantations outside the rubber growing areas of the Middle East. The extent of the territory dealt with in this survey is so enormous that of necessity only a general treatment could be given to the more important points involved in successful rubber growing.

The point is made that a total of more than six million acres of good rubber growing land is available in these 21 Latin-American countries. The obstacles to the possible establishment of a successful rubber plantation industry with American capital are shown to be not insuperable.

This report concludes the series which forms a complete survey covering all tropical areas above and below the equator capable of sustaining a rubber culture. The Department of Commerce has done valuable work in carrying this thorough going survey to a conclusion; and the present report loses none of its interest even though its printing has come several years after the termination of the survey. The findings are as timely now as ever for American financial interests who may be contemplating the establishment of Hevea rubber plantations in the American tropics and in countries that lie but a week's sailing from New York. There are very excellent reasons why the United States as a nation should be interested to have supplies of this valuable raw material as near to our own factories as possible. The world's need for rubber shows no diminution; on the contrary, its consumption is bound to increase.

"Proceedings of the Twenty-Ninth Annual Meeting of the American Society for Testing Materials." Volume 26, 1926. Parts I and II, American Society for Testing Materials, 1315 Spruce street, Philadelphia, Pennsylvania. Paper, 5¾ by 9 inches. Illustrated. Part I, 1204 pages; Part II, 691 pages.

Part I embraces the annual address by the president of the Society, the Edgar Marburg Lecture, annual report of the executive committee and reports by the regular divisional committees on tentative and standard methods of tests. Of special interest to rubber chemists and technologists are the reports on methods for testing insulating materials and textiles.

Part II is devoted wholly to technical papers read before the society. These are grouped under Metals, Cement and Concrete; Symposium on Rosin, Paints and Varnishes; and Miscellaneous Papers. Among the latter group is one entitled "Measurement of Consistency as Applied to Rubber-Benzene Solutions" reporting the results of an investigation by Winslow H. Herschel and Ronald Bulkley of the Bureau of Standards.

"Physics in Industry." Lectures delivered before the Institute of Physics. By Walter Makower and Bernard A. Keen with introductions by Sir Charles Parsons and Sir Daniel Hall. Oxford University Press, American Branch, 35 West 32nd street, New York, N. Y., 1926. Volume IV, Boards, 63 pages, 6 by 9½ inches. Illustrated.

This book contains two lectures, numbers eight and nine of a series, the first with special reference to tire manufacture and the second to soil problems. The functions of the physicist in the rubber industry are very ably set forth in the lecture with respect to raw rubber control, constitution and balance of the component parts in tire design, and testing of the finished product. The physical problems inherent in processing raw rubber from latex to vulcanization are discussed, followed by those involved in the use of cotton. Flexing, fatigue and abrasive wear in finished tires are considered as physical problems.

Rubber manufacturers who read this lecture cannot fail to gain a lively realization of the need of considering the physical as well as the chemical study of rubber manufacturing problems.

"Rutherford's Planters' Note Book of Useful Memoranda for Everyone Connected with the Planting Industries of the Middle East." By H. K. Rutherford. Eighth Edition. Printed and published by The Times of Ceylon Co., Ltd., Colombo, Ceylon. Cloth, 845 pages, 6 x 8½ inches.

Covering the various industries and products of Ceylon, this eighth edition of a well-known work has been resumed after a lapse of eight years, the volume having been completely revised and enlarged. Some ninety pages are devoted to a review of the rubber industry in Ceylon.

BRAZIL HAS BECOME AN IMPORTANT MARKET FOR AMERICAN-MADE automobile tires, the country ranking as third in December purchases of this class of goods, with the following record: 12,080 casings, value $148,922; 4,640 inner tubes, value $8,125; and 287 solid tires, value $13,073.

Abstracts of Recent Articles

THE OXIDATION OF CAOUTCHOUC. This is a three-phase study: (1) Oxidation with dilute aqueous potassium permanganate, giving as final product a polyhydroxy compound; (2) oxidation with hydrogen peroxide, giving as primary product a substance with alcoholic properties; (3) oxidation with chromyl chloride, giving rise to two main products, a resin with aldehydic properties, oxidizable to a resin acid, and a complex, insoluble product containing both chromium and chlorine.—John McGregor Robertson and John Alexander Mair, *J. Soc. Chem. Ind.*, February 11, 1927, 41T-50T.

MICROSCOPIC INVESTIGATION OF RUBBER. Method and apparatus for the microscopic and ultra-microscopic examination of rubber maintained at about 20 mu. by pressure.—H. Dannenberg, *Kauts.*, December, 1926, 276-277.

STRUCTURE OF RUBBER. Consideration of coagulation, mastication, calendering and vulcanization from the modern conceptions as to the structure of rubber.—J. Behre, *Kauts.*, December, 1926, 278-281.

QUANTITATIVE ESTIMATION OF JOULES-EFFECT IN HEAT OF STRETCHING OF RAW RUBBER.—Lothar Hock and Siegfried Bostroem, *G. Z.*, February 11, 1927, 1112.

EXPERIMENTAL ESTIMATION OF THE SURFACE TENSION BETWEEN RUBBER AND FILLERS IN MIXINGS.—Lothar Hock and Siegfried Bostroem, *G. Z.*, February 11, 1927, 1114-15.

RUBBER TOYS. Historical and descriptive review.—Hubert Standring, *R. A.*, London, March, 1927, 43-47.

NEW USES OF RUBBER. Descriptive of applications of rubber latex and solid rubber in the industries and road building.—Sir Stanley Bois, Chairman, Propaganda Committee, R. G. A., *R. A.*, London, March, 1927, 28-31.

SUBMARINE CABLE. Insulation with special reference to the use of rubber.—R. R. Williams and A. R. Kemp, *J. Franklin Inst.*, Vol. 203, No. 1; *I. R. J.*, February 19, 317-320; March 5, 403-405.

UNIFORMITY IN PLANTATION RUBBER.—O. de Vries, *I. R. J.*, February 19, 1927, 313-14.

METHOD OF MEASURING THE CUSHIONING QUALITY OF TIRES.—J. F. Purdy and R. B. Day, *J. S. A. E.*, March, 1927, 389-392.

ECONOMIC OPERATION WITH SOLID TIRES.—L. W. Fox, *J. S. A. E.*, March, 1927, 379-384.

THE ALTERNATING BEHAVIOR OF FATTY ACIDS ADDED TO RUBBER COMPOUNDS.—W. H. Smith and C. E. Boone, *Ind. Eng. Chem.*, March, 1927, 398-399.

MEASUREMENT OF CONSISTENCY AS APPLIED TO RUBBER-BENZENE SOLUTIONS.—Winston H. Herschel and Ronald Bulkley, *Proceedings of the Twenty-ninth Annual Meeting A. S. T. M.*, June, 1926, Volume 26, Part II., 621-629.

THEORY OF NEEDLE FORMATION OF THE RUBBER MOLECULE AND ELASTICITY.—E. Lindmayer, *G. Z.*, March 4, 1927, 1282-84.

PATENT LITERATURE AS A SOURCE OF INFORMATION.—Julian F. Smith, *Chem. Met. Eng.*, March, 1927, 160-162.

PHYSICAL TESTS TO DETERMINE THE EFFECTS OF CHEMICAL OR OTHER TREATMENT ON YARNS. The results of tests on stretch, recovery and regain of fibers under varying loads.—C. F. Goldthwait, *Proc. Am. Asso. Textile Chem. Colorists*, 1927, 1-8. Tables and Graphs.

THE STUDY OF THE COTTON FIBER. The literature relating to the structure, composition and physical and chemical properties of the cotton fiber is reviewed and a bibliography of 65 references given.—A. J. Turner, *Agr. J. India*, 21, 274-94 (1926).

THE EFFECT OF EFFLUENTS FROM RUBBER FACTORIES ON PADI AND THEIR TREATMENT.—B. J. Eaton, *Malay. Agr. J.*, 14, 299 (1926).

SELENIUM IN RUBBER COMPOUNDS.—C. R. Boggs and E. M. Follansbee, *Trans. Inst. Rubber Ind.*, 1926, 2, 272-304.

WHAT IS RUBBER? Chemical and physical views of the structure of rubber.—E. A. Hauser, *Trans. Inst. Rubber Ind.*, 1926, 2, 239-244.

EFFECT OF SOLID COMPOUNDING INGREDIENTS AS SOFTENERS.—E. H. Hurlston, *Trans. Inst. Rubber Ind.*, 1926, 2, 267-271.

DATA ON SPECIFIC GRAVITIES OF CHEMICALS AND MATERIALS USED IN RUBBER COMPOUNDING OR OF GENERAL INTEREST IN CONNECTION THEREWITH. Tabulation.—*I. R. J.*, February 12, 266; February 19, 304; March 5, 388. Serial.

SURFACE COLORING OF RUBBER GOODS BY SPRAYING.—Translated from *G. Z.*, 41, 872 (1927), *I. R. J.*, February 26, 1927, 351-354. Illustrated.

BENZENE VAPOR DANGERS. Home Office Inquiry into the Fire and Explosion at Mandleberg's in Salford, September 28, 1925.—*I. R. J.*, February 26, 1927, 355-360.

HOPKINSON SPRAYED RUBBER. Descriptive of the production of "L. S.," latex sprayed rubber.—Ernest Hopkinson, *Bull. R. G. Asso.*, February, 1927, 105-110.

CUTTING RUBBER. Methods and machinery for cutting rubber in sheets, especially by the Gargiulo machine.—A. P. Brintet, *Rev. Gen. Mal. Plast.*, January, 1927, 50-54. Illustrated.

VOLUME CHANGES ATTENDING THE FORMATION OF RUBBER SOLS. I.—Willis A. Gibbons and Eardley Hazell, *J. Am. Chem. Soc.*, March, 1927, 620-630.

New Trade Publications

THE MINER RUBBER CO., LTD., GRANBY, QUEBEC, CANADA, IS sending out a combined calendar and catalog, attractively printed in color. The well-illustrated catalog indicates the company's extensive production of rubber and tennis footwear, rubber heels, waterproof clothing, and rubberized fabric.

"U. S. TIRE RETAILER" IS THE TITLE OF A NEW HOUSE ORGAN issued in the interests of its dealers by the United States Rubber Co., 1790 Broadway, New York, N. Y. E. S. Underhill is editor of the new publication, and Donald Fairbairn is associate editor.

"RADIO LOG BOOK, BROADCASTING STATION WTAQ," IS THE title of an illustrated booklet being sent out by the Gillette Rubber Co., Eau Claire, Wisconsin, the publication containing not only descriptions of the company's individual radio station but also of its rubber products.

AN ILLUSTRATED CATALOG OF TWENTY-ONE PAGES IS BEING SENT out by the Standard Insulator Co., Ltd., Winsley House, Wells street, London, W. 1. England. The organization manufactures molded ebonite for magnetos, and also for wireless and X-ray apparatus, as well as for use in many other trades. Mechanical and dental rubber goods are also included in the company's products.

A BULLETIN IS BEING ISSUED BY THE UNIVERSITY OF MICHIGAN, Ann Arbor, Michigan, in connection with courses offered in chemical engineering and allied subjects. There are advanced courses in colloid and organic chemistry which fit the needs of graduate students in rubber chemistry. The university is well provided with laboratories and special equipment for research and graduate work in chemical engineering.

"LEAD PIPE PRESSES AND EQUIPMENT" IS THE TITLE OF A SMALL illustrated bulletin being sent out by the John Robertson Co., Inc., 133 Water street, Brooklyn, New York, manufacturer of hydraulic presses and pumps.

"RUBBER—FACTS, FIGURES, FORECASTS, 1926-1927." SOME INteresting statistics regarding rubber production and consumption appear in this pamphlet of twenty-eight pages issued by Hymans, Kraay & Co., Market Buildings, 29 Mincing Lane, London, E. C. 3, England.

"THE TIRE RATE BOOK—JANUARY, 1927." THIS WELL-KNOWN publication, which is issued every quarter by Edward Lyman Bill, Inc., 383 Madison avenue, New York, N. Y., contains as usual much information of interest to the industry. This latest number reviews the balloon tire situation, particularly the appearance of ten new balloon tire sizes.

Obituary

Edward Payson Hurd

Following a short illness, Edward Payson Hurd, long identified with the United Shoe Machinery Corp., Boston, Massachusetts, died February 23, at Milton, Massachusetts. He had retired some time ago from active participation in business.

Born at Medway, Massachusetts, on June 28, 1841, Mr. Hurd was educated at Phillips Andover Academy, later taking part in the Civil War and serving three years in Company K, 16th Connecticut Volunteers. In his earlier business life he was associated with various shoe manufacturing companies, while in 1899 he became one of the organizers of the United Shoe Machinery Corporation, serving successively as vice president, assistant treasurer, and member of the executive and finance committees. He is survived by one daughter and three sons, all three of the sons being connected with the United Shoe Machinery Corporation.

Legal Decisions

Grasselli Chemical Co. v. National Aniline & Chemical Co., Inc.; District Court, Southern District, New York, No. E. 27-22, January 24, 1927.

In this suit for infringement of U. S. Patent No. 1,149,580, by the defendant's sales of diphenylguanidine and triphenylguanidine to rubber manufacturers, the following claims 1 and 4 were held invalid.

1. The process of producing vulcanized rubber which comprises incorporating with rubber a small amount of an ammonium compound having a dissociation constant greater than 1x10-8 and having a basic reaction at the vulcanization temperature, and heating the resulting product with a vulcanizing agent to effect vulcanization.

4. As a new article of manufacture vulcanized rubber combined before vulcanization with a small amount of an ammonium compound having a basic reaction at the vulcanization temperature and having a dissociation constant greater than 1x10-8.

Judge A. N. Hand rendered the opinion of the Court, and held that the claims in suit were invalid for lack of invention and granted a decree dismissing the bill with costs.

No. 943,358, Paul W. Litchfield, pneumatic tire, validity of claims 1, 2 and 4, denied where discovery set up as base of invention is that two friction producing surface contacts made more friction than one, the fact that cross ply intercontact would make more friction than parallel ply contact being both obvious and familiar, and where no outstanding and not to be expected merit in selected method of crossing plies is shown, nor clear general public acquiescence in the monopoly.—Goodyear Tire & Rubber Co. v. Michelin Tire Co.; Circuit Court of Appeals, 6th Circuit.

The Weiss patent, No. 1,411,231, for vulcanization accelerator, held valid. Dovan Chemical Co. v. Corona Cord Tire Co., 16 F. (2d) 419 (C. C. A. Pa.).—*Official Gazette*, Volume 356, p. 250.

MOTORSHIPS' ADVANTAGES AS RUBBER CARRIERS

The essential requirements of carrying rubber, it is pointed out by shippers, are an even temperature, good ventilation, and that it be stowed on its own blocks and kept away from other cargo. Tea, for example, is ruined if it comes in contact with rubber. Heat of boilers will dry and oxidize crude rubber. With motorships there is no heat from the boiler room to contend with. Coal dust, which permeates every part of a ship when coaling, no matter how carefully done, works into the rubber and consignees do not know whether it is coal dust or bark and naturally condemn the rubber. Hence the advantage which is claimed for oil-burning vessels as rubber transports.

American Society for Testing Materials

Committee D-13

A well attended and successful meeting of Committee D-13 was held March 11 and 12, 1927, at the Massachusetts Institute of Technology, Cambridge, Massachusetts. Thirteen sub-committees held meetings.

Action taken at the general business meeting included offering of tentative revisions on the existing standards entitled Standard Specifications for Tolerances and Test Methods for Tire Fabrics; Standard Specifications for Tolerances and Test Methods for Cord Tire Fabrics; Standard Specifications and Tests for Osnaburg Cement Sacks. Certain sub-committee reports of special interest to the rubber industry were as follows:

D. E. Douty, chairman of Sub-Committee V, presented a very complete report on Nomenclature and Definitions. These detailed tentative definitions were recommended for advancement to standard.

J. L. Mead, chairman of Sub-Committee VI on Tire Fabrics, explained that his committee has eliminated from its Standard Specifications for Tolerances and Test Methods for Tire Fabrics, other than Cord Fabrics, the definitions which are not needed now that the scoring system has been eliminated.

W. H. Whitcomb, chairman of Sub-Committee XI on Knit Goods, reported that since last fall samples have been tested by five laboratories in order to check the tentative specifications previously drawn up. The results were favorable and the committee wants more time for investigation before its specifications are suggested for advancement to standard.

Committee D-11

Great interest was shown in the meetings of the Sub-committees of Committee D-11 A. S. T. M. held at the Bellevue-Stratford, Philadelphia, Pennsylvania, on March 16 and 17.

It was found necessary to divide the work of Sub-Committee XII among three new sub-committees: on life tests or aging of rubber compounds; on abrasion tests as applied to rubber compounds; and on flexing tests as applied to rubber and fabric compositions. A definite program for life tests will be submitted to the members of the committee.

The interest in abrasion testing, which began with tires, has extended into the field of mechanical rubber goods, for example, belting and hose and also insulated wire.

Flexing tests have been confined to a comparison of a rapid flexing test made with the United States Rubber Co.'s flexing machine, of which there are now eleven in operation in various rubber factories. While the committee does not feel that it is in a position to recommend a machine with definite specifications, it does believe that the flexing machine is proving of sufficient interest as to justify recommending a method for testing rubber belts.

So much interest has been shown by consumers of rubber products designed to absorb vibratory shocks that a request has come to Committee D-11 for the committee to make a study of these products with a view to preparing methods of testing, specifications, etc. A committee will be appointed later to take up this study.

FOR CLEANING RUBBER FLOORS

The American Soap Corporation, 475 Fifth avenue, New York, N. Y., is recommending to the industry the use of one of its products known as Amzo. The manufacturers claim that Amzo is particularly adapted for cleaning rubber floors of all types, that it makes no suds, and is an odorless disinfectant. One ounce of Amzo, diluted with a gallon of water, is said to make a most satisfactory cleanser, severe tests having proved that the liquid is never injurious to rubber floors. Louis C. Darling is vice president of the American Soap Corporation.

Financial and Corporate News

United States Rubber Co.

TO the Stockholders: The following is a report of the operations of the company for the year ended December 31, 1926, and of the financial condition of the company as of the close of the year. Sales for the year amounted to $215,528,309, an increase of $9,054,572 compared with 1925. Profits were adversely affected by the violent decline in crude rubber prices during the first six months of 1926, which forced drastic reductions in selling prices, especially of tires, before high cost rubber, necessarily carried in inventories or on commitment, could be converted into finished goods and sold.

Crude rubber, the basic raw material of the industry, was selling as low as 34½ cents per pound in January, 1925. By July of that year the market had advanced almost 300 per cent to a peak of $1.20 per pound, and in December, 1925, was still as high as $1.09 per pound. A violent recession then set in, and in January, 1926, the market declined to 67 cents per pound and, with wide fluctuations, continued to recede throughout the year, reaching 42 cents per pound in July, 1926, and at the close of the year was about 38 cents per pound, or at practically the same level as when the upward trend began two years before. As of the date of issue of this report the market price is above 40 cents per pound. This clearly shows that current market quotations as of any date cannot be taken as a safe indication of the value of crude rubber.

Stated on the basis of the actual conditions which existed during 1926, the net surplus earnings for the year amounted to $8,535,380 after all charges and after providing for dividends on the preferred stock. In view of the continuing uncertainty of crude rubber market prices, it was deemed advisable to set aside this entire amount as a reserve against inventories.

Net income from operations, before interest on the funded indebtedness, but after all other charges except depreciation of plants, amounted to $17,928,750; interest on funded indebtedness amounted to $6,455,592, leaving net income from operations, after interest charges, of $11,473,158; dividends on the preferred stock amounted to $5,226,489, leaving $6,246,669; provision for estimated depreciation of plants amounted to $3,711,289, leaving surplus from operations for the year, after all charges, of $2,535,380; a dividend was received, representing net profits of the rubber plantations for the year 1926, amounting to $6,000,000, thus making net surplus earnings for the year of $8,535,380. The consolidated surplus as of December 31, 1926, amounted to $40,798,676.

Current assets as of December 31, 1926, amounted to $153,958,811 and current liabilities amounted to $33,671,658. The current assets consisted of: $8,235,073 cash; $47,418,811 accounts and notes receivable from customers; $3,357,130 accounts, notes and loans receivable, other than from customers; $48,456,222 inventories of finished goods; $46,491,575 inventories of raw materials and supplies and goods in process.

The current liabilities consisted of: $11,800,000 bank loans; $21,871,658 accounts payable, including acceptances payable for importation of crude rubber.

As indicated above, the accounts and notes receivable from customers, amounting to $47,418,811, exceeded the total current liabilities of $33,671,658 by the sum of $13,747,153.

Inventories of finished goods were taken at cost of production, which was less than current selling prices. Approximately two-thirds of the finished goods were located at the company's sales branches. Inventories of raw materials and supplies were taken at cost prices, which, with the exception of crude rubber, were below or approximately at market prices. As previously explained current market quotations as of any date are not indicative of the real value of crude rubber inventories. However, in view of the continuing uncertainty of crude rubber market prices, the entire net surplus earnings for the year, amounting to $8,535,380 after all charges and after providing for dividends on the preferred stock, were set aside as a reserve against inventories.

Contractual liabilities, representing forward commitments for raw materials and supplies, including crude rubber, were approximately at market prices, and as to quantities covered future requirements for conservative periods.

The reserve of $3,000,000 appropriated from the surplus earnings for 1925, as stated in the annual report for that year, "to be applied against the cost of crude rubber to be received during the year 1926," was used during the year for the purpose for which it was created.

The company retired $2,893,000 of funded indebtedness during the year, consisting of: $709,000 of 5 per cent bonds and $184,000 of 7½ per cent notes, retired through the operation of the sinking funds, and $2,000,000, of 6½ per cent serial gold notes paid March 1, 1926.

The company closed the year in a strong financial position, as indicated by the consolidated general balance sheet.

C. B. SEGER, Chairman.

Approved by the Board of Directors, March 3, 1927.

CONSOLIDATED GENERAL BALANCE SHEET—DECEMBER 31, 1926

ASSETS		
Cash	$8,235,073.03	
Accounts and notes receivable from customers (less adequate reserves for doubtful accounts)	47,418,811.30	
Accounts, notes and loans receivable, others (current)	3,357,129.51	
Total cash and receivables		$59,011,013.84
Inventories of finished goods	$48,456,221.84	
Inventories of materials and supplies, including goods in process	46,491,575.28	
Total inventories		94,947,797.12
Total current assets		$153,958,810.96
Plants, properties and investments including rubber plantations, less reserve for depreciation		184,631,856.10
Securities of corporations not included in United States Rubber System		6,019,904.28
Notes receivable of employes given for purchase of common stock and secured by such stock; common stock of U. S. R. Co. held under service contracts and agreements; and common stock of U. S. R. Co. held by a subsidiary company		6,249,790.15
Prepaid and deferred assets		4,972,135.71
Total assets		$355,832,497.20
LIABILITIES, RESERVES AND CAPITAL		
Bank loans	$11,800,000.00	
Accounts payable, including acceptances payable for importation of crude rubber	21,871,657.75	
Total current liabilities		$33,671,657.75
Funded indebtedness		110,227,800.00
Reserves for insurance	$2,266,208.60	
General reserves	1,673,855.93	
Reserve for dividend on preferred stock, payable February 15, 1927	$1,302,200.00	5,242,264.53
Reserve against inventories		8,535,380.42
Open account with United States Rubber Plantations, Inc.		4,310,105.26
Capital stock—preferred	$69,000,000.00	
Less amount held by a subsidiary company	$3,890,000.00	$65,110,000.00
Capital stock—common	$81,000,000.00	
Minority—Dominion Rubber Co., Ltd., stock	258,800.00	
Total capital stock	$146,368,800.00	
Fixed surpluses—subsidiary companies	6,677,813.63	
Surplus (subject to final determination of federal taxes for years subsequent to 1917)	40,798,675.61	
Total capital stock and surpluses		193,845,289.24
Total liabilities, reserves and capital		$355,832,497.20

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Aetna Rubber Co.	Com.	$0.25 q.	Apr. 1	Mar. 16
Aetna Rubber Co.	Pfd.	$1.75 q.	Apr. 1	Mar. 16
Century Rubber Mills	Pfd.	1¾% q.	June 1	May 20
Faultless Rubber Co.	Com.	$0.50 q.	Apr. 1	Mar. 15
Faultless Rubber Co.	Pfd.	1¾% q.	Apr. 1	Mar. 15
Firestone Tire & Rubber Co.	7% Pfd.	$1.75 q.	May 15	May 1
Firestone Tire & Rubber Co.	6% Pfd.	$1.50 q.	Apr. 15	Apr. 1
Firestone Tire & Rubber Co.	Com.	$1.50 q.	Apr. 20	Apr. 10
General Tire & Rubber Co.	Pfd.	1¾% q.	Apr. 1	Mar. 19
Goodyear Tire & Rubber Co. of Canada	Pr. Pfd.	1½% q.	Apr. 1	Mar. 15
Goodyear Tire & Rubber Co. of Canada	Pfd.	1¾% q.	Apr. 1	Mar. 15
India Tire & Rubber Co.	Com.	$0.625	Apr. 1	Mar. 21
India Tire & Rubber Co.	Pfd.	$1.75	Apr. 1	Mar. 21
Intercontinental Rubber Co.	Com.	$0.25 q.	Apr. 1	Mar. 19
Miller Rubber Co.	Com.	$0.50 q.	Apr. 25	Apr. 5
Norwalk Tire & Rubber Co.	Pfd.	1¾% q.	Apr. 1	Mar. 25
Seiberling Rubber Co.	Pfd.	$2.00 q.	Apr. 1	Mar. 19

New York Stock Exchange Quotations

March 23, 1927

	High	Low	Last
Ajax Rubber, com.	11¼	11	11¼
Fisk Rubber, com.	18⅛	17⅝	17⅞
Fisk Rubber, 1st pfd. (7)	87	87	87
Goodrich, B. F., Co., com. (4)	54¼	52⅛	54¼
Goodyear Tire & Rubber, pfd. (7)	104	103½	103½
Kelly-Springfield Tire, com.	19	17¾	18½
Kelly-Springfield Tire, pfd.	60	60	60
Keystone Tire & Rubber, com.	⅝	⅝	⅝
Lee Rubber & Tire, com.	8	7⅝	8
Norwalk Tire & Rubber, com.	4⅛	4⅛	4⅛
United States Rubber, com.	62	60⅛	61⅜
United States Rubber, 1st pfd. (8)	109⅜	109⅜	109⅜

Akron Rubber Stock Quotations

Quotations of March 22, supplied by Otis & Co., Cleveland, Ohio.

Company	Last Sale	Bid	Asked
Aetna com.	18	..	20
Aetna pfd.	95	..	97
Falls com.	4⅞	2	4
Falls pfd.	10	..	15
Faultless com.	37½	35⅝	37½
Firestone com.	127½	125	130
Firestone 1st pfd.	105	105	..
Firestone 2nd pfd.	101	100	..
General com.	150	150	155
General pfd.	102½	102½	110½
Goodyear com. V. T. C.	41	..	41
Goodyear pfd. V. T. C.	101½	..	..
Goodyear pr. pfd. V. T. C.	108	..	..
India com.	28	..	29
Miller com.	34	..	..
Miller pfd.	102½	102½	102¾
Mohawk com.	17	..	16
Mohawk pfd.	74	..	45
Seiberling com.	24½	24	25
Seiberling pfd.	100	..	100
Star com.	2	1	4

TEN NEW BALLOON TIRE SIZES

The introduction of the small, European type of car has resulted, according to the Miller Rubber Co., Akron, Ohio, in the standardization of ten new tire sizes, all with a rim diameter of less than twenty inches. The actual sectional width, however, is said to be no less and the type of construction just as heavy as in tires of larger rim diameter, the change being merely in the diameter of the rim. Since the introduction of the new types the number of standard passenger car sizes of balloon tires has increased to thirty-three, while the ten new sizes are being used on large as well as small cars.

The following are now standard sizes, each having a rim diameter of less than 20-inches: 27 by 4.40; 28 by 4.75, with rim diameter of 19 inches; 31 by 6.75, rim diameter 19 inches; 28 by 4.95, rim diameter 19 inches; 28 by 5.25, rim diameter 18 inches; 29 by 5.25, rim diameter 19 inches; 30 by 6.00, rim diameter 18 inches; 31 by 6.00, rim diameter 19 inches; 31 by 6.20, rim diameter 19 inches; 30 by 6.75, rim diameter 18 inches; 30 by 6.20, rim diameter 18 inches.

New Incorporations

B. & J. TIRE CO., INC., July 2, 1926 (Minnesota), capital stock of $50,000. Incorporators and officers: J. H. Burton, president and treasurer; G. A. Johnson, vice president; E. Johnson, secretary, all of Minneapolis, Minnesota. Principal office, Minneapolis, Minnesota. To deal in rubber goods, etc., and to operate tire repair and sales shops.

BAERCO TIRE SALES & REPAIR CO., INC., March 17, 1927 (New York), capital $2,000. Incorporators: Albert Fives, 7207 Hollywood Street; Timothy Fives, 802 Knickerbocker avenue; and Hyman Rosen, 410 E. 96th street, all of Brooklyn, New York. Principal office, Brooklyn, New York. Tires, accessories.

BROADWAY TIRE SERVICE CORP., February 19, 1927 (New York), capital $25,000. Incorporators: Simon S. Liebman and Mae T. Liebman, both of 880 Warren street; and Hugo Seckendorf, 169 Second avenue, all of Albany, New York. Principal office, Albany, New York. Auto tires, etc.

BRONX JACKSON TRUCK TIRE CO., INC., March 16, 1927 (New York), capital $20,000. Incorporators: Herman Dressel, Thomas Fisher, both of 359 Jackson avenue; and John J. Ryan, 355 E. 149th street, New York City. Principal office, Bronx, New York. Tires, etc.

CONVOY RUBBER CO., INC., March 15, 1927 (New York), capital, 100 shares no par value. Incorporators: William Hirsch, 1580 First avenue; Phoebe Feiner, 2246 Walton avenue, both of New York City; and Gladys Plotkin, 1455 E. 19th street, Brooklyn, New York. Principal office, Manhattan, New York. Auto tires.

DEVINE RUBBER Co., February 17, 1927 (New Jersey), capital of $100,000 preferred stock and 2,000 shares common stock without par value. Incorporators: James W. Devine, 12 Llewellyn Place, and John Hartlander, 54 Handy street, both of New Brunswick, New Jersey; and Borden D. Whiting, Llewellyn Park, West Orange, New Jersey. Principal office, 31 Clinton street, Newark, New Jersey. To import, export, buy and sell crude and refined rubber and other materials of which rubber forms a part.

DIAMOND TIRES, INC., December 7, 1926 (Oregon), capital stock of $5,000. Incorporators: George L. Rauch and J. F. DuPaul, both of Yeon Building, Portland, Oregon; and H. H. Rost, Portland, Oregon. Principal office, Portland, Oregon. Tires.

GASPEE TIRE CO., January 24, 1927 (Rhode Island), capital $35,000 common stock. Incorporators: F. F. Wulkop, 241 Broad street, Providence, Rhode Island; R. E. Sheldon, 431 West Market street, Akron, Ohio; and Marietta Wulkop, 1572 Massachusetts avenue, Cambridge, Massachusetts. Principal office, Providence, Rhode Island. To deal in automobile tires.

GREEN BAY AUTO PARTS CO., January 11, 1927 (Wisconsin), capital stock 250 shares of $100 each. Incorporators and officers: P. R. McGinn, president, 1034 Grignon street; A. C. Huth, vice president, 935 S. Jackson street; and F. E. McGinn, secretary and treasurer, 1022 Grignon street, all of Green Bay, Wisconsin. Principal office, Green Bay, Wisconsin. To deal in auto parts and accessories.

HARTFORD RUBBER PRODUCTS CORP., March 11, 1927 (New York), capital 200 shares, no par value. Incorporators: Abner Schoen, 1667 Nelson avenue; George Licsak, Jr., 240 West 24th street, and Helen Bernstein, 517 West 159th street, all of New York City. Principal office, Manhattan, New York. Tires.

KLION TIRE CORP., March 8, 1927 (New York), capital $10,000. Incorporators: I. Tanenbaum, Max Klein, both of 45 Mill street; and Samuel Klionsky, 88 De Russey street, all of Binghamton, New York. Principal office, Binghamton, New York. Tires, auto accessories, etc.

THE MONTJOP CO., INC., February 25, 1927 (New York), capital 1,100 shares, 100 shares par value $100, and 1,000 shares no par value. Incorporators: Reginald H. Davies, Theodora E. Ayuso and Henry Hazen Reed, all of 68 William street, New York City. Principal office, Manhattan, New York. Rubber, metals, fabrics.

NEW ENGLAND TIRE AND SALES CO., INC., March 10, 1927 (New York), capital $250,000. Incorporators: Ben Miller, 72 East 55th street; Abner Schoen, 1667 Nelson avenue; and H. Bernstein, 517 West 159th street, all of New York City. Principal office, Kings County, New York. Tires, etc.

NEW ROCHELLE RUBBER CO., INC., March 11, 1927 (New York), capital $20,000. Incorporators: John V. Russo, 133 Colonial Place; L. William Santasiere, 116 E. 176th street, both of New Rochelle, New York, and Sylvia B. Bloom, 2355 64th street, Brooklyn, New York. Principal office, New Rochelle, New York. Rubber tires.

PEERLESS ELASTIC FABRIC CO., March 1, 1927 (Rhode Island), capital stock of $100,000 common stock. Incorporators: Harold St. John Guild, James H. Foley, Jr., and William J. Story. Principal office, Providence, Rhode Island. To manufacture, buy, sell, etc., rubber, elastic and fibrous materials.

RUBBER SHOCK INSULATOR CORP., February 19, 1927 (Delaware), capital stock of 2,500 shares preferred, and 2,500 shares common stock, all without nominal or par value. Incorporators: T. L. Croteau, A. L. Miller, and Alfred Jervis, all of Wilmington, Delaware. Principal office, Wilmington, Delaware. To make, purchase and sell rubber goods and all articles of which rubber is a component part.

THE STANDARD CO., INC., February 22, 1927 (Vermont), capital $10,000. Incorporators: Ross Preston, Bedford, Province of Quebec, Canada; Bruce R. Corliss and Charles D. Watson, both of St. Albans, Vermont. Principal office, St. Albans, Vermont. To manufacture, buy, sell and deal in specialties, and novelties made of rubber, leather, paper and other materials.

STAR RAINCOAT CO., February 18, 1927 (Delaware), capital stock of $10,000, par value $100. Incorporators: Frank A. Cabeen, Jr., Haverford; Henry P. Benson, Ardmore, and I. Raisch, 5504 Cedar avenue, Philadelphia, all of Pennsylvania. Principal office, with the United States Corporation Company, Dover, Delaware. To manufacture, buy, sell and deal in raincoats of every character and description.

SUBERS SPECIALIZED RUBBER PRODUCTS CORP., February 7, 1927 (Delaware), capital stock of 100,000 shares of common stock of no par value. Incorporators: Lawrence A. Subers, Dr. Paul Traub and Dr. Donald W. Rupert, all of Trenton, New Jersey. Principal office, with the Corporation Service Co., 900 Market street, Wilmington, Delaware. To manufacture and deal in rubber and rubber products.

ZIM-CHASE TIRES, INC., January 20, 1927 (Washington), capital $10,000. Incorporators: R. W. Chase and E. Zimmerman. Principal office, Bellingham, Washington. To deal in all kinds of tires and accessories.

The Rubber Industry in America

New York

Vansul, Inc., 90 West street, New York, N. Y., is a recent addition to New York concerns dealing in chemicals and pigments for the rubber trade. Officers of the corporation are: Theodore G. Sullivan, president and treasurer; John De Camp Van Etten, vice president; and Mrs. Frances L. Sullivan, secretary.

The Dexter Rubber Manufacturing Co., Inc., Goshen, New York, specializing in the production of rubber tire accessories, has been placed in the hands of E. Bright Wilson and Edward R. Dexter, receivers. Liabilities are estimated at $200,000 and assets $300,000.

The Chemical Catalog Co., Inc. moved on February 19 to new and larger quarters at 419 Fourth avenue, New York, N. Y.

The Public Service Tire & Rubber Co., Inc., 1254 Bedford avenue, Brooklyn, New York, has opened a branch establishment at Bay Ridge, Fourth avenue and Sixtieth street, Brooklyn. The organization handles all standard makes of tires and carries on a wholesale and retail business.

The New York Rubber Co., Inc., Beacon, New York, has been reorganized and now has no connection whatever with the Tucker Rubber Corporation, the bondholders of the first-mentioned concern having purchased the Beacon plant and all the company's assets. Morgan W. Jopling, one of the leading bondholders and a representative of certain important financial interests in New York City, becomes the New York Rubber Co.'s president, while L. D. Bigelow, for several years connected with the old organization, becomes vice president and general manager. Offices have again been established at the company's plant in Beacon.

The Tucker Rubber Corporation, 32 Spencer street, Buffalo, New York, has announced that its business is in process of liquidation and that an equity receivership has been established for the purpose of furthering the process. Following a meeting on February 21 of the company's creditors, John H. Kelly, a director of the Hewitt Rubber Co., and Edward M. Wilkes were named coreceivers. The Tucker enterprise was formed from the mechanical goods division of the Federal Rubber Co., and has for some months owned and operated the New York Rubber Co., Beacon, New York.

R. & H. Essay Contest

An essay contest was recently planned by Mrs. Elizabeth Roessler and Mrs. Elizabeth Hasslacher, widows of the founders of The Roessler & Hasslacher Chemical Co., 709-717 Sixth avenue, New York, N. Y. One thousand dollars in cash prizes was to be distributed among the contestants, who were to take as their subject "The Roessler & Hasslacher Chemical Company's Place In Industry." The first prize went to Carl Seiler, the company's representative at Baltimore.

India Rubber World in New Quarters

After May 1, 1927, THE INDIA RUBBER WORLD will make its home in the newly-completed Graybar Building, 43rd street and Lexington avenue, New York, N. Y.

Graybar Building—New Home of The India Rubber World

Exclusive of basement space, this structure represents the world's largest office building, while its location, adjoining the Grand Central Station, makes it especially easy of access. Without going out of doors it will be possible to reach three subways, as well as both levels of the Grand Central Terminal. Edward Lyman Bill, Inc., the organization of which THE INDIA RUBBER WORLD is an operating division, has leased the entire fourth floor of the Graybar Building. Our friends are invited to visit us and inspect the new offices.

Wishnick-Tumpeer, Inc., 251 Front street, New York, N. Y., specializing in chemicals and colors for the rubber industry, has announced the purchase on March 1 of the Pioneer Asphalt Co., Lawrenceville, Illinois, an organization which for the past twenty years has been manufacturing mineral rubber for use in rubber compounding. John Young, formerly chief chemist of the Firestone company, and later associated with the National Aniline & Chemical Co., has become connected with the Wishnick-Tumpeer organization as vice president in charge of the rubber division, and in addition has purchased an interest in the Pioneer company and will become its president and general manager.

Operations at the Pioneer factory will be carried on as heretofore, with no extensive changes in personnel, although the plant is soon to be enlarged. The chemical laboratory of Wishnick-Tumpeer, Inc., which has been located at 43 Summit street, Brooklyn, New York, with J. M. Dawson as chief chemist, has been dismantled and all equipment forwarded to Lawrenceville, while Mr. Dawson becomes head of the laboratory at the Pioneer plant. Mr. Young, after supervising the necessary changes at Lawrenceville, will make his headquarters at the Wishnick-Tumpeer offices in New York City.

Personals

Walter W. Evans, formerly technical superintendent of the Mechanical Goods Division of The B. F. Goodrich Co., Akron, Ohio, has joined the technical staff of the R. T. Vanderbilt Co., 50 East 42nd Street, New York, N. Y. Mr. Evans will assist Mr. Somerville in extending the application of Vanderbilt products in the rubber and other industries, particularly the use of anti-oxidants in the oil and electrical industries.

E. J. Teasdell, manager of the accessories division of The Gates Rubber Co., Denver, Colorado, has been making a business trip to the eastern states, spending several days of his time in visiting New York City and its vicinity.

J. H. Goldberg has been apponted the New York sales manager of the C. & C. Rubber Co., 121 Benefit street, Woonsocket, Rhode Island, manufacturer of raincoats and other outer garments. Mr. Goldberg's headquarters are at 1270 Broadway, New York, N. Y.

Robert Watt has been placed in charge of the New York City offices opened by the Chicago Rubber Clothing Co., Racine, Wisconsin, the New York address being 1270 Broadway.

New Jersey

The New Jersey rubber industry is showing improvement, in all branches, while orders for tires are increasing rapidly and steadily. The advent of seasonable weather has greatly benefited the situation and retail dealers are increasing orders. Tire manufacturers announce that an increase of from 12½ to 15 per cent in the price of tires and tubes will go into effect soon. Manufacturers claim that present prices offer little profit and that they will be much benefited when the new price goes into effect. Mills manufacturing mechanical goods report no let up in production. Hose, belting and packing departments have been busy for some time. There has been an improvement in hard rubber production and also in heels and soles.

The Murray Rubber Co., Trenton, New Jersey, has increased tire and tube production and the curing department is operating twenty-four hours a day. The company is installing new tire equipment to keep up with new business. The mechanical department is 10 per cent ahead of last year's production.

The Combination Rubber Co., Trenton, New Jersey, is very busy and officials predict a prosperous season ahead. The company is operating with two shifts.

The Ajax Rubber Co., Trenton, New Jersey, is operating at 80 per cent capacity and expects increased business.

C. Edward Murray, president of the Murray Rubber Co., Trenton, New Jersey, has returned from an extended business trip to Louisville, Chicago, and other points in the south and west.

The Bergougnan Rubber Co., Trenton, New Jersey, has been sold by the Citron-Byer Co. and the Bergougnan Realty Corp., to Brewster Grace, a real estate broker, of Philadelphia. While the sale price has not been made public it was held at $200,000. Charles E. Stokes, receiver, recently sold the plant to the Bergougnan Realty Corp., for $115,000. The property includes factory buildings and nine acres of ground. It is estimated that the replacement cost of the buildings would be approximately $500,000.

The Enterprise Rubber Co., Yardville, New Jersey, has filed a petition of bankruptcy in the United States District Court at Trenton, New Jersey, listing liabilities of $26,902.76 as against assets of $7,438.75. The assets comprise factory buildings at Yardville, valued at $5,000 and $2,000 worth of machinery and equipment.

Charles E. Stokes, president of the Home Rubber Co., Trenton, New Jersey, has returned from a business trip to St. Louis and other western points.

Paul Motzke has opened the Miller Tire Service Co., 444 South Broad street, Trenton, New Jersey, and has been appointed distributer of Miller tires and tubes for four counties in the state.

The Firestone Tire & Rubber Co., Philadelphia, Pennsylvania, with the assistance of the Eagle Tire Co., Trenton, New Jersey, conducted a dinner and meeting at Trenton on March 18. About 150 tire dealers were present from Mercer, Burlington, Monmouth, Hunterdon Counties, New Jersey, and Bucks County, Pennsylvania. Films of the Firestone plantations in Liberia were shown.

The Murray Rubber Co.'s suit against Sears, Roebuck & Co., to recover $5,521,103 damages for alleged breaking of a contract, came to an ending before Judge Bodine, in the United States District Court at Trenton, New Jersey. After a conference between counsel for both sides and Judge Bodine it was announced that the case would be settled out of court. Terms of settlement were not made known, but it is said that Sears, Roebuck & Co. made a substantial cash payment to the Murray Company.

George W. Winters, for many years purchasing agent for the La Favorite Rubber Co., Paterson, New Jersey, has been appointed secretary and assistant treasurer of that concern.

Dr. Erwin Meyer and A. Schoen of the Meyer-Schoen Engineering Co., Detroit, Michigan, sailed on March 19 for Europe, where they will spend several months visiting certain foreign rubber manufacturers. While in Europe they will introduce the De Mattia book type individual vulcanizing molds and also the complete line of tire building equipment manufactured by De Mattia Brothers, Inc., Clifton, New Jersey. Both Dr. Meyer and Mr. Schoen expect also to act in a consulting capacity, and hope to assist certain continental rubber interests along chemical and engineering lines.

Charles B. Kieffer is now a sales representative of the Phelps Tire & Rubber Co., Garfield, New Jersey, his territory including several midwestern states.

The Manhattan Rubber Manufacturing Co., Passaic, New Jersey, specializing in the production of mechanical rubber goods, announces the reelection at the company's annual meeting of the following executives: Arthur F. Townsend, president; F. L. Curtis, vice president; H. M. Green, vice president; C. T. Young, vice president; William F. Gaston, treasurer; C. E. Cummings, assistant treasurer; Hamilton Abert, secretary; H. E. Smith, assistant secretary; W. H. Dunn, comptroller.

Julian K. Morrison and Leonard Goodwin have been elected president and treasurer respectively of the Brighton Mills, Passaic, New Jersey, manufacturer of tire fabrics. These two executives are the successors of Henry J. Haigh, who has resigned as president and treasurer. The organization is operating two plants, one being the Southern Brighton Mills, Shannon, Georgia, and the other the Brighton Mills, Allwood, New Jersey.

The Consumers Rubber Refining Co., Inc., 337-339 Pine street, Elizabethport, New Jersey, announces that the recent receivership action was instituted by two companies trying to collect contested bills.

Pennsylvania

The Lee Tire & Rubber Co., Conshohocken, Pennsylvania, reports that the mechanical subsidiary, the Republic Rubber Co., Youngstown, Ohio, has a healthy increase in business, particularly in the demand for truck tires. At the Conshohocken plant, production is being increased on the new shoulder built tire, which is being well received.

William D. Weed has been appointed a representative of The Norwalk Tire & Rubber Co., Norwalk, Connecticut, his territory including the Philadelphia, Baltimore, and Washington districts. He has been associated with the tire industry for a number of years.

Allen Patent Valid

The United States Court of Appeals at Philadelphia has rendered a decision in the suit by John F. Allen, Allison Himrod, Edw. E. Allen and the Continental Rubber Works against the Vulcan Rubber Co., in which the Court reverses the decision of Judge Schoonmaker.

Judge Schoonmaker heard the case sometime ago in Erie and decided that the machine used by the Vulcan Rubber Co. did not infringe the Allen patent. The Allen patent relates to a press for making battery boxes and this has been extensively developed and used by the Continental Rubber Works.

The Court of Appeals in reversing the decision decided that the Allen patent is valid and that the rubber presses used by the Vulcan company in making battery boxes are an infringement and directs an injunction restraining the Vulcan Rubber Co. from further use of the presses and an accounting for past infringement.

Massachusetts

The production pendulum of rubber goods in Massachusetts has swung from footwear to mechanical goods and tires. Seasonal slackening in shoes is general; Cambridge, Converse, and Firestone plants are running five days a week; Hood is on a 60,000 pair a day schedule which is two thirds of the plant capacity. The fiscal years of most of these mills end April 1 and they are therefore putting inventories into shape.

Tires and tubes are approaching the active season with good demand. The stiffening in rubber prices has removed the bogey of a price reduction, and the talk of an advance has stimulated buying. Hood is increasing output and is expected to reach a 3,000 daily tire ticket soon; Converse is now at 300 and building up to 500 with the production sold for six weeks ahead. Fisk reports full time operations.

Early spring weather in March has helped the distribution of tires and tennis footwear, and department stores and retailers are demanding early spring deliveries. The enormous productive capacity of the industry soon filled the requirements, however. Probably the shortages of winter footwear experienced several years ago will not be seen again for some time. This is because the mills are now more efficient than five years ago, and with the new companies in the field, it does not take long to produce adequate volume of goods. Hood, Goodrich, Converse, Cambridge, and Firestone have all increased capacity, and with the new companies such as Tyer and Servus in the field, shortage conditions cannot exist long.

Paul W. Litchfield, president of the Goodyear Tire & Rubber Co., visited Boston last month to attend a corporation meeting of the Massachusetts Institute of Technology and visit the Boston Automobile Show. Mr. Litchfield is a native Bostonian and has a summer home at Duxbury, to which he brings his family every summer. Mr. Litchfield helped the tire situation here considerably when he set at rest rumors of a price cut. "Sales of Goodyear are ahead of the corresponding period of 1926," he said; "our plant is running on a full time basis with three shifts employed, and our current production is the greatest on record. Tires are now at their lowest price in history, and any future move in price will be upward."

The new Somerville Ford assembly plant was formally opened during the week of March 7-12 and 106,000 visitors were conducted through the $6,000,000 plant which has been in operation since last December. Production is now 200 cars a day and will be stepped up to 400 at the end of April. The plant represents the greatest advance made by the company to date in assembly plant design. Mason, United States, and Goodyear tires are being used for original equipment at the present writing. In connection with the opening of the plant it is announced that Ford sold 29,957 cars in Massachusetts in 1926, three times that of his nearest competitor.

The Stedman Products Co., South Braintree, Massachusetts, equipped the new Statler Hotel in Boston with rubber tiling.

Converse Rubber Shoe Co., Malden, Massachusetts, is consolidating warehouse stocks of finished goods in the Naval Nitre Depot just leased from the Navy Department. The new warehouse has upward of 50,000 square feet. The company still holds for another year the four-story warehouse at 175 Purchase street, Boston, but plans eventually call for distribution of New England shipments direct from the factory, which is but four miles from the heart of Boston. The company now maintains branches at New York, Philadelphia, Chicago, and Minneapolis.

The Firestone Tire & Rubber Co., Akron, Ohio, has acquired a tract of land adjoining Brookline avenue, Boston, with a frontage of 100 feet on Brookline avenue and about 430 feet on Fullerton street. The Firestone company will erect a large building to be used for the wholesale tire branch in Boston.

The Converse Tire & Rubber Co. took advantage of auto show week to introduce the new line of tires to the local trade. Through the courtesy of William Filene, a window display of the President tire line was arranged in connection with displays of other New England products. In addition headquarters were established at the Copley-Plaza Hotel during the show.

The Kelly-Springfield, Boston branch, through its manager, E. A. McCoy, reports spring deliveries ahead of a year ago. The company has opened three new branches in New England since last year.

J. Newton Smith has been appointed treasurer of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, to succeed the late George H. Burgess.

E. W. Dunbar, superintendent and secretary of the Cambridge Rubber Co., Cambridge, Massachusetts, has returned to his desk after an attack of grippe.

The Salmon Falls Manufacturing Co., Boston, Massachusetts, formerly manufacturers of tire fabrics, has run out all the stock in process and converted nearly all its inventories into cash. It is rumored that a syndicate is being formed to buy the property and manufacture tire fabric there for several eastern tire mills but nothing definite has materialized yet. Current assets amount to $243,218, and current liabilities to $127,546 as of January 15, leaving net working capital of $127,546. Since January 15, the company has paid off the balance of its bank loans and now owes no money.

H. E. Crocker, district manager of the United States Tire Co., with headquarters at Cambridge; E. D. Manley, manager of the Boston branch of the Firestone Tire & Rubber Co.; M. R. Spransy, Goodyear manager; Fred T. Moore, manager, The B. F. Goodrich; and Nelson P. James, Miller manager, are all enthusiastic over the outlook for tires this spring.

The Monthly Review of the Federal Reserve Bank of Boston shows that sales of rubber footwear in January, 1927, although 25 per cent greater than January, 1926, were considerably less than January, 1924, and January, 1925, and as a result are below the three-year average. This shows how the footwear selling season varies according to weather conditions.

The State Department of Labor reports that employment in rubber footwear decreased in February from 9,459 to 9,232 whereas rubber goods showed a slight drop from 2,969 to 2,892. The average weekly wage decreased in footwear from $26.07 in January to $24.96 in February. In rubber goods the weekly wage increased from $23.65 to $25.83. Indexes showing condition with respect to the five-year average show footwear above normal at 103.8 for February, although less than the January figure of 106.4; and rubber goods, including tires and tubes, at 126.2, an increase from January at 124.8 but not as high as December with 130.6.

Walter E. Piper, treasurer both of the Tyer Rubber Co., Andover, and of the President Suspender Co., recently sailed from Vancouver for Australia, in the interest of both companies. He will be absent from the United States about three months.

Charles D. Maxfield, who has been associated as purchasing agent with The Norwalk Tire & Rubber Co., Norwalk, Connecticut, has resigned in order to become connected in a similar capacity with the Magazine Repeating Razor Co., Sound Beach, Connecticut.

Southern

Associated Tire Manufacturers, Houston, Texas, represent in the southern states certain tire and tube manufacturers whose factories are at Auburn and Indianapolis, Indiana, and Akron, Ohio. The associated companies maintain a large warehouse in Houston, a special feature being made of the tires produced by the Majestic Rubber Co., Indianapolis, Indiana.

The Cline Rubber Co., Charlotte, North Carolina, is the state distributer of tires manufactured by the Birmingham Tire & Rubber Co., Birmingham, Alabama, and the National Tire & Rubber Co., East Palestine, Ohio. T. H. Cline, president, was for eight years associated as branch manager with the Fisk Rubber Co.

The I. J. Cooper Rubber Co., Nashville, Tennessee, a branch of The Cooper Corporation, Cincinnati, Ohio, and a jobber of automotive and radio supplies, is finding its motorcycle service of practical assistance in delivering rush orders to local city dealers, or in meeting the immediate needs of rural dealers.

G. G. Sutton has succeeded Samuel D. Barr as Southern district manager of the Yarnall-Waring Co., Chestnut Hill, Philadelphia, Pennsylvania, manufacturer of power plant devices. Mr. Barr has been placed in charge of the company's Detroit-Cleveland territory, while Mr. Sutton will have his headquarters at 1019 Atlanta Trust Co. Building, Atlanta, Georgia.

The Capital City Tire Co., Atlanta; Hair & Seago, Augusta; and the American Specialty Co., Savannah; are Georgia distributers of tires, especially solids, as manufactured by the Swinehart Tire & Rubber Co., Akron, Ohio.

The Pruitt Tire Co., 320 West Adams street, Jacksonville, Florida, a distributer of Diamond tires and tubes, has opened a branch at Park and Fisk streets, Jacksonville, while another division is also being maintained in South Jacksonville. M. W. Pruitt heads the organization.

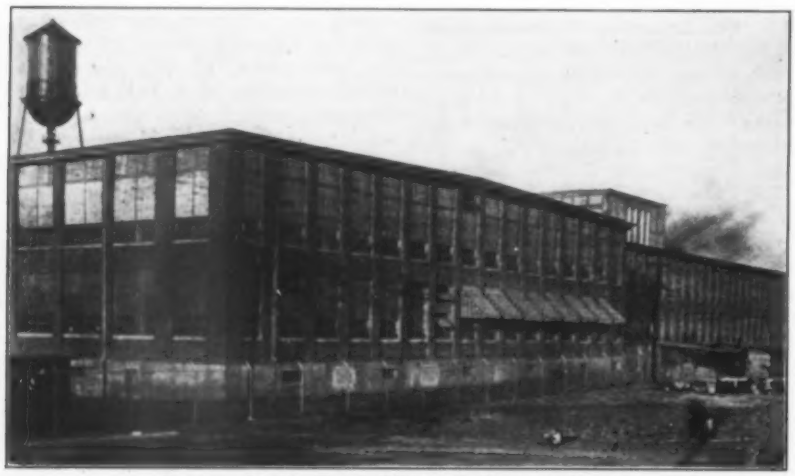
Seiberling All Tread tires are being handled by the Swift Tire Service, 1119 Texas avenue, Shreveport, Louisiana. The company has recently increased its capitalization.

Benton Collins, for some years associated with the Kelly-Springfield Tire Co., 250 West 57th street, New York, N. Y., is now, as a retail merchant, handling Kelly-Springfield goods in Abilene, Texas. N. S. Houk is now in charge of the company's branch at Dallas, Texas.

Goodyear's New Fabric Mill

The Goodyear Tire & Rubber Co., Akron, Ohio, began on February 21 the production of tire fabric in its reconstructed cotton mills at Cedartown, Georgia. A new two-story building has furnished 234,000 square feet of additional floor space, while the number of spindles has been increased from 12,000 to 30,000. The company's property in Cedartown includes 25 acres of land, while its building project has included the construction of 97 new homes for employes, and the remodeling of 52 others already built.

The Cedartown factory is now the largest in tonnage capacity of any fabric plant owned by the Goodyear company, while the combined output of the organization's five fabric mills is more than 40,000,000 pounds yearly, or more than half of its present production requirements.



Goodyear's Tire Fabric Mill at Cedartown, Georgia

Heads Goodyear Rubber Co.

An announcement of importance to the footwear trade is that Frank E. Church has acquired the controlling interest in the Goodyear Rubber Co., Middletown, Connecticut, manufacturers of the well known Gold Seal brand of rubber footwear, and its affiliated company, the Lambertville Rubber Co., Lambertville, New Jersey, manufacturers of Snag Proof footwear, and has been elected president of these two companies. The Goodyear Rubber Co. has distributing branches in New York, Boston, Philadelphia, Chicago, St. Louis and St. Paul, the New York address of the company being 134 Duane Street. Organized in 1872, these companies have been making high quality rubber footwear for over fifty years, their brands being well known to the trade.

Frank E. Church

Mr. Church was first identified with the footwear business as vice president and manager of the Northern Shoe Co., Duluth, Minnesota. In March, 1919, he became manager of the St. Paul branch of the United States Rubber Co., and two years later succeeded to the presidency of the Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut. His next advancement was to the position of manager of footwear sales of the United States Rubber Co., with headquarters at 1790 Broadway, New York, from which he has just resigned to direct the operations of his own companies.

Aggressiveness has been a leading feature in all of Mr. Church's activities, and his knowledge of the rubber and canvas rubber soled footwear business will be of much assistance to him in his new affiliations.

William Edlestone Bros. Tire Fabric Mills of Westbrook, Maine, report good business on their line. The company manufactures cord and square woven fabrics, and is one of the few mills in this line still operating in New England.

Ohio

Automobile tire production, which started on an upward trend last month, continued to gain during March. Rubber factories in the Akron district now are operating practically at capacity levels, but indications are that the peak in sales and output for the first half year has been about reached. Manufacturers have been experiencing a heavy demand from dealers all over the country who report brisk retail tire sales. The good weather has accelerated motoring, and contributed no little to increased tire sales. Many factories were for weeks behind orders, and have been shipping to dealers direct through branches. Heavy purchases have been made of crude rubber, fabrics, chemicals, machinery, etc. Authorities agree that the outlook is better for the industry than it has been for months. More than 130,000 automobile casings a day are now being produced in the Akron district, compared with around 100,000 at the beginning of the year.

Akron manufacturers report that spring dating sales to dealers in the first quarter of the year were the biggest since 1920. This was largely accounted for by the fact that the 1927 spring season has been abnormal, having been advanced about 45 days. There were heavy increases in sales during February and March which ordinarily would have come in April and May.

It is hardly likely that the next three months will see a larger daily output of tires, or other rubber products for that matter, than was reached in March. Dealer business undoubtedly will continue to be good but no one hopes for as heavy purchases from the automobile manufacturers as last year. Automobile production promises to be below that of 1926.

No substantial curtailments in tire production have as yet been made by leading manufacturers and they are not expected to do so for some time. With the exception of Goodyear, however, the big Akron companies are not pushing operations to the limit as they have done in the past five or six weeks. No employes are being laid off, but few new men are being hired. All of which points to a gradual tapering off in tire output during the latter part of March and early April. Goodyear's new balloon tire brought that company a tremendous volume of orders.

Early in March there was some talk of higher tire prices, but so far nothing definite along this line has materialized. Cost of raw materials has advanced since the last price reduction was made, authorities pointed out, and stated a conservative increase in the near future would be in order.

Among those who advocated higher tire prices were P. W. Litchfield, president of the Goodyear Tire & Rubber Co., and William O'Neil, president of the General Tire & Rubber Co. "I think a moderate increase should be put into effect," commented Mr. O'Neil. "Tires are cheaper than they have ever been, and the margin of profit is close. Prices are below prewar levels, which is not true of other commodities."

The Akron Standard Mold Co., Akron, Ohio, is to begin at once the construction of an addition to its plant. This will represent the second new building erected by the organization in less than a year and a half, by means of which the floor space has been practically doubled. A. J. Fleiter is vice president and general manager.

Henry Cassel, formerly associated with the Mason and Firestone organzations, has joined the sales force of the Marathon Rubber Co., Akron, Ohio, and will have charge of the southern territory.

Wishnick-Tumpeer, Inc., 251 Front street, New York, N. Y., specializing in colors and chemicals for the rubber industry, has opened another branch office at 1101 Akron Savings & Loan Building, Akron, Ohio, with G. G. Chase in charge.

Harvey S. Firestone, Jr., vice president of the Firestone Plantations Co., told of his experiences in Liberia and of his company's plans for the development there in a recent address before the Lions Club. The soil, labor supply, climate and government cooperation in Liberia are all favorable, he stated. There are 12,000 employes under direction of 87 white executives, engineers, etc. Motion pictures of the trip were exhibited.

General Tire & Rubber Co., Akron, Ohio, reports steadily increasing sales, and several additions to its tire line, including the heavy and light express tires for speedy truck and bus service and cushion solid tires for trucks. Sales in the first quarter were twice those of the same quarter in 1926. Production has been speeded up at the Akron plant to meet the heavy demand.

The Akron Purchasing Agents Association elected the following members as officers for the ensuing year: Vice President, C. F. Marshall, Seiberling Rubber Co.; National Directors; G. D. Sullivan, Swinehart Tire & Rubber Co., and E. G. Siess, The B. F. Goodrich Rubber Co.; Local Director: M. N. Twyman, The Goodyear Tire & Rubber Co.

Hi-Grade Rubber Co., which was incorporated recently for $25,000, will begin operations in Akron early in April. The plant will manufacture hospital, dentists' and druggists' supplies. Incorporators are: W. H. Crawford; L. C. Broecker; R. M. Harmon; L. L. Carpenter; G. G. Luke; and E. D. Vosper.

Bruce C. Dodd has assumed charge of Ohio sales for the Anderson Prichard Oil Corporation of Oklahoma City, Oklahoma, suppliers of petroleum products to the rubber industry. Headquarters will be maintained in Akron.

The India Tire & Rubber Co., Akron, Ohio, has several new buildings in process of construction, and it is believed that when these are completed the plant output will be in advance of the peak production reached on February 22 of 1,914 tires and 1,961 tubes. Orders at the present time have been more than fifty per cent greater than for the corresponding period of 1926.

Miller Rubber Co., Akron, Ohio, earned $1,025,454.73 during 1926, and the financial position of the company is sound, with current assets aggregating $16,890,968, and current liabilities $5,307,000, leaving a net working capital of $11,583,967.97. During the past year regular dividends of $983,568 were paid on the preferred stock, and $520,182 on the common shares. All directors and officers were reelected at the annual meeting March 10.

P. H. Goodall, assistant sales manager of the Mohawk Rubber Co., Akron, Ohio, is taking an extended business trip through the west and midwest, including in his itinerary the following cities: Dallas, Austin, San Antonio, El Paso, Los Angeles, San Francisco, Portland, Seattle, Denver, Kansas City, and Chicago.

Frank A. Seiberling, president of the Seiberling Rubber Co., Akron, Ohio, announced important factory extensions in Akron at the annual stockholders' meeting March 14. The large factory unit now being completed will enable the company to produce 6,000 tires a day by June 1. January and February sales were approximately 50 per cent ahead of last year. Mr. Seiberling said dividends on common stock may be started if there are no tire price cutting wars this year. All officers and directors were reelected.

Jacob Pfeiffer, president of the Miller Rubber Co., Akron, Ohio, and his wife and party, returned late in February from a five months' trip around the world. Mr. Pfeiffer made a study of taxation in many countries.

White & Co., crude rubber brokers, are now representing the Rubber Regenerating Co., in the Akron district.

The Mohawk Rubber Co., Akron, Ohio, reports a deficit of $223,000 for 1926, due to losses from high priced crude rubber inventories. Charges for future crude rubber commitments required $387,000 more. Sales were $6,500,000, an increase of 24 per cent over 1925, upon which there was an operating profit of $600,743. Directors for 1927 are: M. E. Mason, J. F. Jones, S. S. Miller, J. B. Huber, P. H. Schneider, E. I. Smail, Jr., Gilbert Marsh and R. M. Pillmore. All officers were re-elected.

E. I. du Pont de Nemours & Co., Wilmington, Delaware, announces that its Chicago branch will open a sales office on April 1 at 876 Union Trust Building, Cleveland, Ohio. R. A. Parrett will be in charge of the new division and will represent the company in the state of Ohio, handling Gold Seal Beckton White lithopone. Warehouse stocks of this product will also be carried at Cleveland and Cincinnati.

The National Tire & Rubber Co., East Palestine, Ohio, is operating at full plant capacity, the present output being 1,000 tires and 2,000 tubes daily. Plans for expansion are now being made, and additional machinery and equipment are being purchased. The company's sales during 1926 approximated $2,000,000, this representing an increase over 1925 of 43 per cent.

John F. Schaefer has been appointed general manager of The Cooper Corporation, Cincinnati, Ohio, and its various subsidiaries, including the tire manufacturing division at Findlay, Ohio, the battery division at Cincinnati, and the thirteen branch stores operated in lead-

John F. Schaefer

ing American cities under the name of The I. J. Cooper Rubber Co., and The Cooper Tire & Battery Co. Mr. Schaefer has been associated with the rubber industry since 1909 and has been vice president of The Cooper Corporation since its organization, serving recently as general manager of the tire manufacturing division.

A port of entry was established by the United States Government in Akron, Ohio, March 25, for the benefit of rubber manufacturers handling crude rubber imports. The Akron Chamber of Commerce has been active for more than a year in getting authorization for the port.

Rubber Chemical Engineer

In the continuous process industries, especially such as involve chemical operations, chemical engineers are employed to design the plant layout, equipment and operation. Such service in planning the production features of the larger rubber goods manufacturing establishments is of relatively recent introduction. As the term implies, the work has both chemical

I. W. Robertson

and engineering features, although probably more engineering than chemical. Its scope includes not only the development of manufacturing processes and products, but also recovery and elimination of waste.

One of the well-known chemical engineers in the rubber industry, centering in Akron, is Isaac W. Robertson, native of Paducah, Kentucky, born in 1885, graduated at the University of Kentucky in 1910, followed by post-graduate work at the University of Pittsburgh and Carnegie Institute of Technology. He served as an analyst in the laboratories of the Pennsylvania Railroad Co.; chemist of the Atlanta Steel Co. Later he joined the staff of the United States Bureau of Mines and was engaged in investigations on explosives, oils and gases. In 1915 he became chief chemical engineer of The Miller Rubber Co., Akron, Ohio, which position he holds at present, devoting especial attention to solvent recovery in coating machines, dipped goods and spreaders. Under his charge are all installations pertaining to the chemical engineering problems of air conditioning, ventilation, dust recovery, etc.

Apart from his business and professional connections, he holds memberships in the Masonic and Odd Fellows Orders.

George Kemmerer has been appointed manager of the Toledo, Ohio, branch of the Goodyear Tire & Rubber Co.

S. G. Luther, formerly in charge of the development department of the Philadelphia Rubber Works Co., is now connected with the sales division of The Akron Rubber Reclaiming Co., Barberton, Ohio.

John F. Dush, a former Goodyear branch manager, has joined the sales staff of the Seiberling Rubber Co., Barberton, Ohio.

Head of Olin Laboratories

With the interests of the smaller rubber manufacturer in mind, R. R. Olin has recently established in Akron, Ohio, a fully-equipped testing and experimental laboratory, which provides unusual facilities for research work. Mr. Olin has had a wide experience in the rubber industry, having held successively positions of responsibility with several of the leading rubber organizations. A graduate of Akron University in the class of 1909, and majoring in chemistry, he began his business career in Akron where from 1908 to 1920 he was associated with the Goodrich company in engineering and production work in practically every department of the plant. His next connection was with the Faultless Rubber Co., where from 1920 to 1924 he held the position of engineer in charge of routine factory control, while he was also instrumental in developing new processes of manufacture of surgical goods. During the year 1924-25 he was with the Reliance Rubber Co., Ltd., London, England, where he was interested in the erection of a new factory and the installation of modern equipment and methods of manufacture. Returning to the United States, Mr. Olin then again became associated with the Faultless organization, remaining for a

R. R. Olin

year and a half as consulting engineer with that concern and the Swinehart Tire & Rubber Co. He is a member of the American Chemical Society and an associate member of the India Rubber Institute, England.

Midwest

The Pioneer Rubber Mills, San Francisco, California, announces the opening of a factory branch in Chicago, Illinois, under the management of Edward P. Cox, formerly New York branch manager.

Sears-Roebuck's 1927 spring and summer catalog announces a further reduction in tire and tube prices because "a cut in rubber gives lower cost on tires and tubes." The catalog says that since the announcement of new tires less than a year ago they have been sold to "hundreds of thousands of users," and that "each week and each month our sales are sweeping to new and record-breaking figures." Two grades of tires are offered, the Allstate, guaranteed for 12,000 miles, and the Dearborn, guaranteed for 8,000 miles. Last year the former was guaranteed for 10,000 miles.

The Wahl Co., Chicago, Illinois, manufacturer of the "Eversharp Pencil," has expanded its rubber department which was originally established to furnish pen and pencil barrels. Competitive conditions in the pen and pencil field have led the company to diversify its line, and as a result other rubber articles, such as wringer rolls, and various hard and soft rubber products are now being turned out at the Chicago plant.

Joseph A. Berger & Co., general factory representative, has removed its offices to 451 East Ohio street, Suite 506, Chicago, Illinois. The organization is engaged in selling entire or partial outputs of factories.

Thomas A. Maguire was elected president and general manager of the Servus Rubber Co., Rock Island, Illinois, at a recent meeting of the stockholders. He succeeds Judson J. Adams, who has resigned. The following directors were elected: T. A. Maguire; H. H. Cleveland; W. A. Rosenfield; H. E. Curtis; I. S. White; C. A. Beers; L. B. Icely; M. S. Heagy; and C. A. Hallgren.

L. H. Bardach, formerly connected with the Tucker Rubber Co., is now with the mechanical goods division of The Republic Rubber Co., Youngstown, Ohio, and is making his headquarters in Chicago.

The Corduroy Tire Co., Grand Rapids, Michigan, reports a substantial gain in the number of units sold during the past year, although the financial increase was not in proportion to the gain of the year previous. All officers were re-elected at the company's annual meeting held recently.

The Cooke Rubber Co., Fortieth and South Ferree streets, Kansas City, Kansas, manufactures tire accessories, including reliners, skived and plaster patches, Self-Vulco boots, etc. J. F. Cooke heads the organization, which originally began business as the Cooke-Lawson Rubber Co.

T. D. Cornman has been made manager of the branch at Kansas City, Missouri, maintained by the Pennsylvania Rubber Company of America, Jeannette, Pennsylvania. He succeeds C. F. Kent, who has been transferred to the company's San Francisco branch.

M. A. Marquette at Corduroy

M. A. Marquette, for the last twenty-one years associated with the tire manufacturing industry, is now factory manager of the Corduroy Tire Co., Grand Rapids, Michigan. This connection, effective March 15, followed many years of business relationship between Mr. Marquette and L. A. Brown, president of the Corduroy Co.

Mr. Marquette is a well known figure in the tire world, having for the last twelve

M. A. Marquette

years been associated with the Fisk Rubber Co., Chicopee Falls, Massachusetts, as superintendent and factory manager. He entered the tire business in 1906, being first associated with the G. & J. Tire Co., which later became a part of the United States Rubber Co. Later he was factory manager of the Mansfield Tire & Rubber Co., which he left to go with the Fisk organization in 1915.

In taking up his new duties at the Corduroy plant, Mr. Marquette will receive the support of an experienced staff, while the factory itself is fitted out with thoroughly modern equipment.

W. R. Chamberlain has been appointed tire sales manager at the Omaha, Nebraska, branch maintained by the Hood Rubber Products Co., Watertown, Massachusetts.

The Gates Rubber Co., Denver, Colorado, announces the completion of construction work for one of its plant units, and the installation of new machinery. This expansion will provide 30,000 more square feet of floor space, which will be devoted exclusively to the manufacture of braided garden hose, the new unit making it possible to add over five miles to the company's daily production.

The Latex Tire Co., Fond du Lac, Wisconsin, reports the election of the following officers for 1927: Orlando J. Koll, president; E. J. Shaw, vice president; Nathan Haessly, secretary; and F. H. Boyle, treasurer. Reports indicated a good business with increase of production during the past year and the establishing of a number of dealers' accounts, especially in the central northwestern territory. A branch office has also been opened in Nashville, Tennessee.

O. S. Tweedy has been appointed manager of branch sales by the Ajax Rubber Co., Racine, Wisconsin. The branch sales department represents a new division, while other activities of the company will include a still further development of its dealer organization. L. M. Van Riper is continuing his work as general sales manager.

C. H. Price of The B. F. Goodrich Rubber Co., Akron, Ohio, spoke before the Twin Cities Association of Purchasing Agents recently on "From Plantation to User," tracing the development of the rubber industry from the early experiments of Goodyear to the plants of the present day, dwelling particularly on modern practice and applications of rubber.

The La Crosse Rubber Mills Co., La Crosse, Wisconsin, is erecting a new building, 72 by 442 feet, which will be in operation by late summer. This will increase the productive capacity of the mill 30 to 40 per cent. Officers of the company are Albert P. Funk, president and treasurer; William P. Funk, vice president; and Arthur S. Funk, secretary and general manager.

The Gates Rubber Co., Denver, Colorado, reports that its sales in January and February of fan belts and radiator hose were more than 14 per cent greater than those for any corresponding period in the company's history. During the first quarter of the organization's fiscal year ended March 1 domestic sales of mechanical rubber goods increased 26½ per cent, while exports to foreign countries increased 232 per cent.

Bernard Lutz has been named distributer for the Mason line of tires for Denver and the Rocky Mountain district.

Pacific Coast

Pierre E. Meyers, the new manager of the San Francisco branch of the Kelly-Springfield Tire Co., reports that sales are averaging 20 per cent higher than the spring sales of 1926. Mr. Meyers had been Seattle branch manager and succeeded William Kibwell, who has become a Kelly-Springfield dealer in Fresno, California.

The Norwalk Tire & Rubber Co., Inc., Norwalk, Connecticut, has moved its Pacific Coast factory branch from 1045 Brannan street, San Francisco, to 290 Twenty-first street, Oakland, and has put R. H. Chase in charge.

The Pioneer Rubber Mills, San Francisco, California, has completed its building programme at the works in Pittsburg, Contra Costa County, near San Francisco, and is operating on two shifts in several departments. Domestic business is showing steady improvement, and there has been a marked increase in foreign business during the past few months.

The Hood Rubber Products Co. has appointed A. J. O'Connor Pacific Coast district manager with headquarters at 585 Howard street. He succeeds M. R. Stephenson, who has joined the staff of the Hood factory in Watertown, Massachusetts. The Coast branch will concern itself chiefly with tires, leaving the footwear business to be handled from the East. Hood tires sales are said to be exceptionally good.

The New York Belting & Packing Co.'s San Francisco branch, 519 Mission street, which is fifteen years old, notes a marked improvement in sales of oil field supplies, factory belting, garden hose, and general mechanicals over the first quarter of 1926, according to Pacific Coast Manager A. H. Gregory. The company also has a Los Angeles branch at 941 East Third street in charge of Ernest Allen.

C. F. Kent has been appointed manager of the branch maintained at San Francisco, California, by the Pennsylvania Rubber Company of America, Jeannette, Pennsylvania. Since joining the organization in 1912, Mr. Kent has been branch manager successively in Seattle, Dallas, and Kansas City, Missouri, having been with the last-mentioned division for the past ten years.

The Firestone Tire & Rubber Co. has appointed C. B. Jones Pacific Coast division manager with headquarters in San Francisco. H. G. Miller, who was at the latter city a short time, has taken charge of the Denver branch. Firestone business has been exceptionally good lately, all through the Coast territory, some large sections showing 60 per cent increase during the past three months over the first quarter of 1926.

The B. F. Goodrich Co. has appointed A. L. Fullwood, for several years its advertising representative in the Southwest, to direct all its Pacific Coast publicity from San Francisco.

William O'Neil, president of the General Tire & Rubber Co., addressed nearly 200 Pacific Coast dealers at a recent convention at the Palace Hotel, San Francisco. He stated that his company does the largest exclusive dealer business of any in the country, and that its sales for 1926 were over $2,000,000 more than for 1925. Other executives present were Howard F. Smith, western sales manager; Frank Gable, production expert; and H. S. Quine, publicity manager.

Durable Mat Co., Inc., manufacturer of patented non-skid mats, 2926 Sixteenth avenue, S. W., Seattle, Washington, reports that business for January, 1927, was three and one-half times that of January, 1926, and that the expansion is being well sustained. The working force has been doubled within a year. Large sales are being made to the U. S. Navy, as well as to numerous steamship lines, theaters, office buildings, etc. The mats are made of 2½-inch blocks stamped from old tire casing sidewalls looped with steel wire or brass rods. The company's officers are: Howard R. Lyons, president; H. W. Bell, vice president and manager; Charles T. Lyons, secretary-treasurer; Sam R. Israel, sales manager.

The C. R. Griffith Rubber Mills is the new name adopted by the American Belting & Hose Co., manufacturers of rubber-covered rolls and general mechanical rubber goods, East Water and Yamhill streets, Portland, Oregon. The concern is still conducted mainly by members of the Griffith family, and there has been no change in the list of officers. The company reports business as very good, with a marked increase in sales of general mechanicals. The best specialty is the "Grippo" non-slip pulley, the demand for which is keeping a large part of the mill force working sixteen hours daily.

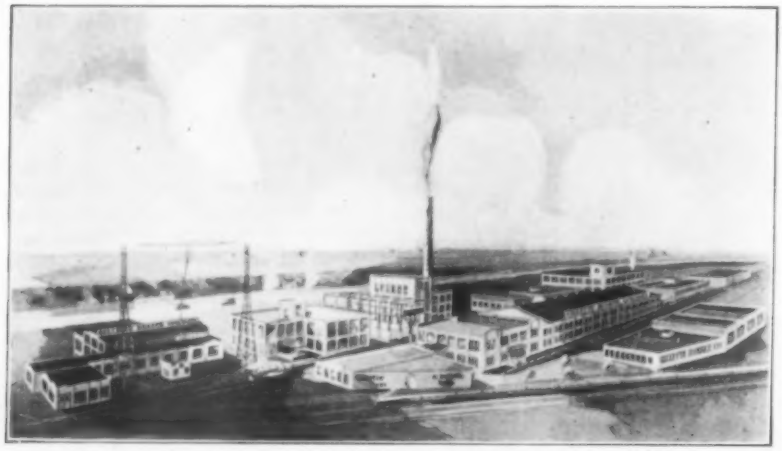
The Columbia Tire Corporation, Portland, Oregon, announces that J. F. Cullen, superintendent in charge of engineering, has perfected a bead-building machine that saves a minimum of 28 cents a tire, or $140 daily on 500 tires. Building, pressing, trimming, and buffing are all done on one machine, and, it is reported, a bead is produced with a 5,000-pound breaking strain on Ford tire sizes, and up to 18,000-pound for the largest casings.

The Malcom Rubber Co., Portland, Oregon, is a distributer in Oregon and parts of the Washington territory of

Gillette on the Air

The Gillette Rubber Co., Eau Claire, Wisconsin, has its own broadcasting equipment, the station, WTAQ, utilizing a thousand watts, while the power battery consists of 1,025 cells, producing 2,050 volts. The radio plant, constructed by engineers at the Gillette factory, is on one of the higher hills of the northwest Wisconsin plateau, the towers rising 150 feet above the control room and free from the interference of other lines.

The Gillette organization specializes in automotive rubber goods, its present plant capacity being 4,000 automobile tires, 10,000 tubes, and 3,000 bicycle tires daily. The company utilizes a water cure process in its manufacture of inner tubes.



Gillette's Broadcasting Station and Plant, Eau Claire, Wisconsin

tires manufactured by the Swinehart Tire & Rubber Co., Akron, Ohio.

The Triangle Tire Co., Inc., 125-131 Eastlake avenue, Seattle, Washington, has begun operations in its new $100,000 building. The company handles Corduroy cord tires.

Goodyear Tire & Rubber Co.'s Los Angeles production for mid-March was 7,500 casings and 7,000 tubes daily. The school of tire repairing is very popular, students coming from all the western states to take the four-weeks' course. Goodyear dealers or employes may enroll without charge, others pay $25, which will be refunded when repair materials are bought. J. K. Hough, manager of sales, states that dealers are replenishing stocks, being confident of big sales. Recent guests at the plant were: E. W. Sandford, Portland; R. P. Morgan, Seattle; and W. H. Bining of El Paso, all branch managers; and Joseph Jacobs, of Perry, Jacobs & Co., Goodyear dealers in Denver. Robert Mehrtens, Goodyear representative in Honolulu, has been transferred to San Francisco, as assistant branch manager. He has been succeeded in the Hawaiian Islands by G. N. Sooy. The Goodyear stockholders' annual meeting will be held April 14.

The J. R. Reilly Rubber Co., owned by J. R. Reilly, and which recently disposed of its tube-making plant in Los Angeles, has been appointed sole distributer for Southern California by the Michelin Tire Co. Mr. Reilly will erect a new Michelin building, and meanwhile sales and service departments will be at 1830 South Hope street, Los Angeles.

The Paragon Rubber Corp., 4827 Huntington drive, Los Angeles, has recently been refinanced and put in a much stronger position, according to Harold G. Cogswell, president. In addition to general mechanical goods, tire repair stock, etc., the company manufactures twelve separate lines of automobile accessories, such as rubber-base lacquers, dressings, top repair material, etc. The company has discontinued making the National cushion tire, later called the Nevada cushion tire; and has contracted with an Akron concern for its manufacture. George W. Dryer has retired as secretary and has been replaced by C. Norcross.

J. B. Magee, Los Angeles branch manager of the United States Rubber Co., has been absent for a fortnight on a business trip in the eastern states.

T. A. Toomey has been appointed by the Pennsylvania Rubber Company of America, Jeannette, Pennsylvania, as manager of its branch at Los Angeles, California. Except for a period during the war, Mr. Toomey has since 1914 been connected with the company's San Francisco division as salesman and office manager.

The Seiberling Rubber Co., Akron, Ohio, has moved its Los Angeles, California, branch to larger quarters at 2472 Enterprise street.

C. C. Osmun, president of the Marathon Rubber Co., Akron, Ohio, has returned to Akron from an extended trip through the western, southern and eastern sections of the country. While in California, he arranged for the distribution of Marathon tires through the following organizations: the A. M. Scott Tire Co., San Francisco, California; Charles Morgan, Los Angeles, California; the Malcom Rubber Co., Portland, Oregon; and the Jensen-King-Byrd Co., Spokane, Washington.

The California Wire & Cable Co., Orange, California, manufacturer of rubber and other insulated wire and cable, reports unfulfilled orders totaling 6,000,000 pounds. A large part of the working force is on double shift. An order for over $100,000 has just been received from the City of Los Angeles, and several large ones have also been received lately from Mexico and the Philippine Islands.

Cord tire fabric will soon be manufactured in the San Joaquin Valley of California from locally-grown acala cotton if plans are carried out for the establishment of a textile mill at Corcoran. An option has been taken on the old sugar refinery at that place and a group of San Francisco capitalists have assured $200,000 for the equipment of the mill, the capacity of which will be 2,000 bales of cotton yearly. The Goodyear Textile Mills in Los Angeles have also been manufacturing similar fabric, but their whole output is taken by the adjoining Goodyear tire works, leaving other West Coast tire manufacturers to depend upon the East and South for fabric supplies.

P. W. Senour is now manager of Goodyear Tire & Rubber Co.'s Los Angeles branch.

J. L. Ansdell is in charge of mechanical goods sales for the Goodyear Tire & Rubber Co., in San Francisco, California.

Reclaimed rubber sales to Pacific Coast rubber manufacturers continue to show a steady gain as to quantity and also as to proportion used in comparison with crude rubber. Scarcely five years ago the ratio was hardly one pound of reclaim to four of crude; now the ratio approaches a pound of reclaim to two of crude. Coast factories, it is estimated, can absorb about 750,000 pounds a month. While prices have averaged close to 11 cents for good quality reclaim, one eastern concern, it is reported, is offering to deliver good reclaim to Pacific ports, all charges paid, for 9 cents a pound.

R. & H. Reclaims

The Pacific R. & H. Chemical Corp., a subsidiary of the nationally known Roessler & Hasslacher Chemical Co., has established a rubber reclaiming works at El Monte, California, and will shortly be in a position to make a considerable outturn daily. According to F. S. Pratt, works manager, the product will be standard whole tire reclaim conforming to all usual tests. The company has ten acres with a railroad siding, and in the several substantial buildings have been installed an up-to-date equipment so arranged as to provide for the most efficient routing of material. The machinery includes devices for stripping, debeading, and roll grinding; conveying material to magnetizers, steam digesters in which the scrap is treated with caustic soda, tanks in which the digested stock is washed, clarifiers with which to catch the finer rubber particles, steam-heated drying ovens, and calenders for sheeting and blocking. Steam for digesters and water circulation is provided by two 550-h.p. boilers with oil-burners. Water is pumped and stored in a large tank. Two 60-inch mills are now being put in place. One of the features of the new plant is the completely equipped rubber laboratory, which is in charge of a force of experienced chemists and technicians, who are credited with having made many important improvements in the quality of the product.

Samson Convention

Adolf Schleicher, president of the Samson Tire & Rubber Co., Los Angeles, California, addressed the delegates to the company's recent eighth annual sales convention, which was unique in that it was the first time Atlantic salesmen ever attended a sales conference here of a western tire company. It was announced that a Samson home office executive had already gone to the Atlantic field to increase the sales force in that section. Sales for 1926 lacked only 2.3 per cent of equalling the total sales of 1924 and 1925; and it is believed that this record will be passed in 1927, for which a vigorous advertising campaign has been planned under the direction of Lord & Thomas and Logan, who will handle the entire Samson account. At the Compton factory the Samson salesmen saw a new addition which increases production 500 tires a day, and they also saw an entirely new line of balloon tires with novel features.

The conference closed with a banquet at the Biltmore Hotel, and at which Mr. Schleicher spoke to the salesmen on sportsmanship and ethics in merchandising.

Canada

As predicted in these columns last month that tire prices would go to lower levels, a further reduction that averages from 5 to 10 per cent, has been announced. The popular sizes show an average of 5 per cent decline, while the large sizes show a reduction of 10 per cent. The prices are now about the lowest that they have ever been and this can largely be traced to overproduction. How long prices will remain at this level is problematical, but it will not be at all surprising to see advances in the course of a few weeks.

The Rubber Association of Canada at its recent annual meeting held in Montreal elected John Westren, vice-president and general manager of the Dunlop Tire & Rubber Goods Co., Ltd., Toronto, as president for the ensuing year. The election of Mr. Westren was a most popular one.

Dominion Rubber Company Ltd., Montreal, is utilizing large space in the leading dailies throughout the Dominion announcing three new specials in overshoes for women: The Rain-Slip-on; The Dry-Foot and Gypsy; also another Dominion innovation, the Spat Clog for men, a design registered this year.

The Ames Holden Rubber Co., Ltd., Montreal, features its 1927 line of galoshes with a patented fastener which is guaranteed not to lock, break or rust. The firm is enthusiastic over this fastener which they report is taking exceptionally well.

A. R. Angus, formerly with the Laurentian Shoe Co., Montreal, and agent for the Northern Rubber Co., Ltd., Guelph, Ontario, has been appointed Montreal manager of the latter company, with territory extending west from Three Rivers, Quebec. This firm will remove to more commodious quarters at 228 Lemoine street.

The Dunlop Tire & Rubber Goods Co., Ltd., Toronto, held its annual meeting recently, when it was announced that the total issue of bonds, dated March 1, 1912, and amounting to $600,000, had been retired in full through the medium of the sinking fund. This retirement removes the only bond indebtedness of the company. Hon. E. B. Ryckman, K.C., M.P., is president; J. Westren, vice president and general manager, and A. E. King, secretary treasurer and assistant general manager.

The Woodstock Rubber Co., Ltd., Woodstock, Ontario, which secured a charter last summer, is a new concern in the rubber industry, and stock in this company is being sold.

C. A. Jones, formerly assistant sales manager of the Seiberling Rubber Co., Akron, Ohio, has been appointed vice president of the Seiberling Rubber Co. of Canada, Ltd., recently organized to take over the K. & S. Rubber Goods Co., of Toronto. Mr. Jones has had 20 years' experience in the rubber industry, having served with the Goodyear and Seiberling companies in druggists' sundries, mechanical goods, and tire departments. R. J. Thomas will be secretary-treasurer, and W. W. Sanders factory manager of the new company.

C. A. Jones

K. & S. Co., through which Seiberling will materially expand its Canadian sales, has had a substantial volume of business for ten years, its 1926 total being $2,500,000, or 12 per cent of all Canadian tire dealer business. Five branches are operated. Besides, it has a $350,000 annual business in druggists' sundries, which will be continued and expanded by Seiberling. Officials announce that the policies of exclusive dealership and quality product, which have proved successful with the parent firm, will be continued at Toronto. K. & S. tires will be manufactured in addition to the Seiberling All Tread line.

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, is introducing a new 32 by 6 All-Weather tread pneumatic truck tire to replace 30 by 5 on Ford, Chevrolet and Reo trucks, speed wagons and light buses. This tire has eight plies of Supertwist cord instead of ten, as in the heavy duty 6-inch tire.

Art Brittain, of Montreal, and Canadian representative for the Gates Rubber Co., Denver, Colorado, reports that Canadian sales of Vulco products during 1926 were almost three times greater than those of the previous year.

Eastern Rubber Co., Ltd., Farnham, Quebec, is erecting a new factory at Acton Vale, Quebec, which will cost approximately $125,000 and have a daily capacity of 5,000 pairs of rubber footwear. A. Grise is president and manager, and Eugene Leveille, secretary-treasurer.

Canadian Goodrich Co., Ltd., Kitchener, Ontario, recently received a wire from its New Zealand representative for 25 Silvertown balloon tires and red tubes, which are to be used on the cars that will carry the Duke and Duchess of York on their tour through Australia and New Zealand.

Goodyear Selected Dealers of Vancouver, British Columbia, and district met recently for their 5th annual dinner with forty-five seated at the board. J. E. Stephenson, manager of the Vancouver Branch of the Goodyear Tire & Rubber Co. of Canada, Ltd., presided. The speakers were His Worship, Mayor Taylor, and W. E. Payne, executive secretary of the Vancouver Board of Trade.

W. A. Eden, president of the Dominion Rubber Co., Ltd., Montreal, was a member of the deputation which represented the Shoe Manufacturers' Association of Canada before the Advisory Board on Tariff and Taxation at Ottawa.

Canadian Goodrich Co., Ltd., Kitchener, Ontario, states that the Hi-Press rubber footwear has created an army of "Yessers" and that 20 new lines have been put out this year.

Commercial Tires, Montreal, a new firm specializing in tires, and repair work, has opened up at Dorchester street West, and is functioning as a Firestone sales and service station.

The Canadian Automobile Industry is now one of the most important in the Dominion. The following production figures are taken from reports of the Dominion Bureau of Statistics, and show the onward and upward trend.

Year	Number Vehicles	Selling Value F. O. B. Plant
1920	94,144	$101,465,846
1921	66,246	67,050,209
1922	101,007	81,956,429
1923	147,202	96,614,176
1924	132,580	88,480,418
1925	161,970	110,835,380
1926	205,116	124,217,064

The Canadian Goodrich, Winnipeg manager Mr. Frew, believes the past few months have shown the fallacy of hand-to-mouth buying and depending upon warehouse stocks. Shoemen should place at least fifty per cent of their requirements during the normal placing season instead of ordering as needed. Those merchants who did anticipate their needs benefited by their foresight this season. They had rubbers to sell while others were keeping the telegraph wires hot speeding up orders.

The Rubber Industry in Europe

Great Britain

British Rubber Supremacy

SOME of the leading British publications of the day are expressing their doubts as to England s ability to retain her supremacy in the production of rubber, and in support of this view they point to certain conditions now prevailing in the industry. One authority says that whereas in 1921 the British produced 72 per cent of the world's total rubber supply, in 1926 this figure fell to 61 per cent. Meanwhile, Dutch production rose from 25.6 per cent in 1921 to 34 per cent in 1926, while it has been estimated that during the present year the advance will be to 37.2 per cent. For this conspicuous reversal of conditions in the industry the Stevenson act, in the opinion of many, is directly responsible, it being believed that while British planters have restricted their acreage under the terms of the measure, the Dutch have steadily increased theirs.

One of London's leading business journals also makes a direct claim that the Stevenson plan of restriction has resulted in the reduction of rubber consumption by the United States, combined with an increasing use of reclaimed rubber. After outlining the amendments to the restriction plan which were instituted during the latter part of 1926, *The Statist* continues:

Sooner or later, it is argued in the market, this regulation, no matter how far the temporary reaction apparent in consumption goes, will cause the price of rubber to shoot up again like a rocket. This view seems to us to overlook three possible circumventing factors:

1. The government may by the time the restriction year is up (October 31, 1927) have realized the "vicious circle" created by restriction of British production.
2. The recent slackening of rubber consumption may become still more pronounced in the States, through "accelerators," which chemists regard as a great advance in increasing the resistance of rubber to wear and tear.
3. The possibility that Dutch unrestricted production will again show expansion.

There are now also very large stocks of rubber on hand, which manufacturers appear to be financing a large portion of, and it remains to be seen whether their requirements justify further accumulation of rubber at 1 shilling 9 pence per pound. The coming quarter will put this to the test.

Other British experts interested in the rubber question assert that the restriction measures have tended to confine the use of rubber to the industries in which it is essential, leaving little opportunity for further research work, or the development of new uses for this commodity.

Rubber Meetings

The March sessions of the Institution of the Rubber Industry included the following: a meeting of the Birmingham Section, held March 3, at the Grand Hotel, Birmingham, the leading address on this occasion being made by Dr. S. S. Pickles, who took as his subject "The Effect of Carbon Dioxide and Anti-oxidants Upon Rubber," the paper read at the London session on March 7 being by P. Dunsheath, "Some Electrical Properties of Rubber." On March 10, at a meeting of the Manchester Section, Major N. Blonde spoke on "The Difficulties of Rubber Proofed Garment Manufacture." At the two sessions of the London Section, held March 14 and 21 at the Engineers' Club, subjects of importance to the industry were discussed, the leading paper at the meeting on March 14 being read by C. A. Klein, who took as his subject "Rubber Pigments from the Point of View of the Manufacturer."

Two lectures have been recently given under the auspices of the Research Association of British Rubber & Tire Manufacturers, the first on March 4 at the Engineers' Club, the subject being "The Construction and Vulcanization of the Pneumatic Tire." The second lecture on "Storage and Aging of Vulcanized Rubber," was given March 11, at the Northern Polytechnic, London. On March 10 at the Burlington House, London, a paper was read by B. D. Porritt at a session of the Institution of Chemical Engineers, Mr. Porritt's subject being "Rubber as a Constructional Material in Chemical Engineering."

British Crude Rubber Consumption

There is a steady increase in the number of automobiles and motorcycles being used in Great Britain, with consequently a continued advance in the consumption by that country of crude rubber. It has been estimated that the approximate amount of rubber consumed in the United Kingdom totaled in 1924 22,855 long tons; in 1925, 31,027; and in 1926, 40,246 tons. *The Rubber Quarterly* also states that about 74,000,000 pounds of crude rubber were consumed in 1926 by various industries of Great Britain as compared with probably less than 37,000,000 pounds in 1921. Although attempts are continually being made to extend the uses of rubber, the manufacturers of tires and tire sundries remain the chief consumers, taking approximately 80 per cent of the total imports of this commodity.

British Notes

The Dunlop Rubber Co., Fort Dunlop, Birmingham, announces several changes in its executive personnel, including the following: E. Healey has resigned his position as general sales manager, and has been succeeded by H. Shankland, who in turn will be assisted in his new duties by H. L. Kenward, formerly the company's sales manager for the London district. J. A. Taylor, who for many years has been the company's district manager in Birmingham, has been transferred to headquarters as assistant to the general sales manager for special representation duties.

The Albany Rubber Co. is a new organization, capitalized at £65,000, and formed for the purpose of establishing rubber plantations in the Federated Malay States and elsewhere in the Far East. The company's main offices are at 39 Lombard street, London, E. C. 3.

Chas. Macintosh & Co. (South America), Ltd., is the trade name of a new organization formed for the purpose of carrying on in South America and elsewhere the business of manufacturers of and dealers in india rubber, gutta percha, balata, etc. Pneumatic and other tires will also be produced. The company's offices are at 2 Cambridge street, Manchester, England.

Taylor & Melville, Ltd., Glasgow, Scotland, are the distributers for that country exclusively of the products of the India Tire & Rubber Co., Akron, Ohio, U. S. A. The Scotch organization reports an excellent business in India tires.

Imports into the United Kingdom of crude rubber during the year 1925 totaled 195,800,000 pounds, value £27,839,000, the figures for 1926 rising to 320,900,000 pounds, value £32,378,000. Exports during these two years of rubber manufactures were valued at £7,616,000 for 1925, and £7,946,000 for 1926, the tire and tube values for 1925 and 1926 being £3,079,000 and £4,524,000 respectively. In 1925, the British exports of automobile casings increased 59 per cent over 1924, while shipments in 1926 exceeded those of 1925 in volume, in total value, and in unit value.

France

Delacoste et Cie, 7 rue Notre-Dame-de-Nazareth, Paris, has been formed with a capital of 5,000,000 francs to manufacture and deal in all kinds of rubber goods, particularly balls and rubber toys.

Manufacture de Caoutchouc de Saint-Ouen (formerly Blanchisserie et Teinturerie de Thaon) has been organized to manufacture all kinds of rubber goods and to exploit to this end a manufacturing and commercial establishment at 3, rue Kleber, Saint-Ouen (Seine). The capital amounts to 1,600,000 francs, divided into shares of 500 francs each, of which 3,000 have been allotted the Blanchisserie et Teinturerie de Thaon, Thaon (Vosges).

The Société Internationale de Plantations et de Finance, well-known in the rubber planting industry, recently held an extraordinary meeting at which it was decided to raise the capital from 25,000,000 francs to 50,000,000 francs by creating 25,000 shares of series A and 225,000 shares of series B, for 100 francs each, to be issued at par plus 12.50 francs for costs.

The Société Generale des Etablissements Bergougnan and V. Baudonnel have formed a company, V. Baudonnel et Cie, with capital of 600,000 francs, to operate at La Poirie, Tendon (Vosges) and to undertake the weaving of all kinds of industrial cottons, to manufacture and convert all kinds of textiles, particularly for the rubber industry.

For the business year 1925-1926 the Bergougnan concern reports net profits of 12,367,231 francs, which with the carry-forward leaves a total available balance of 14,875,499 francs. A dividend of 50 francs per share was voted.

Etablissements Grammont, Paris, with the cooperation of the General Electric Co., London, and the Western Telephone Co., has organized the Société des Telephones Grammont, with a capital of 18,000,000, to execute all orders which the Grammont concern may receive for constructing automatic telephone apparatus to be installed in Paris. Full control remains in the hands of the Etablissements Grammont.

Denmark

The imports of rubber into Denmark during 1926 included: crude rubber, 5,861 quintals against 5,005 in 1925; automobile tires, 1,433 quintals against 2,242 quintals; automobile treads, 15,731 against 12,356 quintals; bicycle treads 7,166 against 9,191 quintals; bicycle tubes, 1,377 against 2,643 quintals; rubber hose with fabric, 953 against 714 quintals; other rubber goods, 5,282 against 4,974 quintals; rubber footwear, 6,386 against 3,465 quintals.

Germany

Germany imported 250,000 quintals of crude rubber, value 120,000,000 marks during 1926. Of this amount 19,000 quintals, value 9,000,000 marks, were reexported, so that Germany's consumption during the year was 231,000 quintals, value 111,000,000 marks. To this, however, must be added the balance left from 1925. During that year the increasing prices of rubber led many manufacturers to lay in large quantities of raw material, respectable amounts of which were left over to be used in 1926. The total imports of crude rubber came to 360,000 quintals, value 176,000,000 in 1925. Most of the rubber entering Germany comes from the Dutch East Indies, which in 1926 supplied 104,000 quintals. Next came British India, with 57,000 quintals, Ceylon with 29,000, Malaya 22,000 and Brazil 19,000 quintals.

As for manufactured rubber, exports from Germany were 162,360 quintals, value 98,921,000 marks in 1926, against 156,696 quintals, value 95,487,000 marks the year before. At the same time, the imports of rubber goods were 34,672 quintals, value 18,861,000 marks and 21,217 quintals value 13,425,000 marks in 1926 and 1925 respectively. It will be noted that the 1926 increase in imports is over 50 per cent of the 1925 amounts.

The diversity of types and sizes of German rubber goods has called forth much criticism from those interested in the welfare of German industry. Only recently, the variety of tire sizes has been cut down and now serious efforts are being made to standardize hospital supplies and surgical goods. In this, as in many other matters of business and industrial efficiency, America is the model held in mind by most people. At Frankfort-am-Main the first meeting of the Trade Standards Bureau Hospital, or rather of the subordinate group for standardizing rubber supplies was recently held and the questions of quality, types and sizes were discussed. It appears that these first transactions were handled with a gratifying degree of unanimity so that it should not be long before definite standards for many rubber surgical and sanitary goods are fixed.

Germany at the Paris Exhibition

The German rubber industry was well represented at the Seventh International Rubber Exposition recently held in Paris, and made a particularly good showing in the machinery department. T. S. Fries Sohn, Frankfort-am-Main, had models of their mills on the stand of the K. D. P. Ltd., London, on which the Revertex process was demonstrated. Exhibits of Krupp-Grusonwerk, Magdeburg, and Fr. Schwabenthan & Co., Berlin, attracted much attention. The former firm had on view creping and sheeting machines and the latter showed its standard sheet machine for printing sheet. Joseph Clermont, Aachen, is agent for the well-known accelerator Vulkacit Bayer and had in its stand samples of this product as well as of the new Vulkacites 470 and Thiuram, besides the anti-oxidant Aldol. Runge-Werke A.-G., Spandau, exhibited various types of reclaims, among others Deutscher Gummi and recent brands of so-called solvent reclaims, Erwaplast and Erwasol.

Leipzig Fair

The Leipzig Fair Committee recently sent out a circular announcing that at the Spring Fair to be held shortly, the British will have their own special exhibition. The exhibits will include sporting goods, raw materials and raw products, crude rubbers and rubber goods, insulated cables and accessories, textile goods.

This notice has called forth much criticism and loud protests from manufacturers here who declare that the Leipzig Fair Committee menaces the welfare of the German industries by permitting the holding of special exhibitions by foreigners on the Leipzig Fair grounds. The Leipzig Fair is a purely German institution intended to assist German industry and supported by contributions from Germans and it is felt that the committee has forgotten the purpose for which it was created.

The Association of German Tire Manufacturers, Hannover, announces that from February 15, the leading German rubber manufacturers have reduced their prices for motorcycle tires, passenger car tires and super-elastic as well as giant pneumatic tires for trucks and omnibuses.

Phil. Penin, Gummi-Waaren-Fabrik, (A.—G.,) Leipzig, W. 34, has taken over all the assets and liabilities of the organization formerly carrying on business as Leipziger Gummi-Waaren-Fabrik, A.-G., vorm. Julius Marx, Heine & Co., Leipzig-Grosszschocher, thereby considerably increasing the productive capacity of the first-mentioned organization. Operations will be continued at the Leipzig-Grosszschocher plant, the building to be known as Factory 2.

The Rubber Industry in the Far East

Malaya

TOWARDS the end of 1926, exports of rubber from Malaya took a sudden upward trend and showed sharp increases over the figures for previous months, so that the year closed with total shipments aggregating 391,336.62 tons against 316,825.41 tons in 1925. The net increase, therefore, was 74,511.21 tons.

Imports of rubber from countries outside Malaya totaled 151,245.66 tons for 1926 against 158,022.54 tons in 1925. The figures for December, 1926, were 14,716.50 tons against 13,964.49 tons for December, 1925. Receipts of foreign rubber in Malaya during the earlier months of 1926 had averaged so much less than those for 1925 that it was pretty generally estimated that shipments of so-called native rubber would show a decrease of about 20 per cent, as compared with the previous year, and the final results showing a decrease of about 4½ per cent must have upset quite a few estimates of future production in which "the considerable decrease in native production" figured more or less prominently.

The quantity of latex exported during 1926 amounted to 2,087,849 gallons.

Foreign Imports

The foreign imports of rubber into Singapore and Penang figure so prominently in Malayan statistics, that details of the sources of this imported rubber should prove valuable and figures recently issued by the Acting Registrar of Imports and Exports are here added.

The imports came from the Netherlands East Indies, Sarawak and British North Borneo, Indo-China, Siam, Burma and other neighboring countries, and totaled 151,246 tons, 28,213 tons being dry rubber and 123,033 tons wet.

The Netherlands East Indies exported 132,938 tons or 88 per cent of the total, Sumatra's share being 85,059 tons, comprising 7,648 tons sheet and crepe, 65,901 unsmoked sheet and 11,510 lower grades; while Borneo sent 43,911 tons made up of 3,363 tons dry, 34,133 tons unsmoked sheet and 6,415 lower grades; Java sent 1,477 tons and other Dutch islands 2,491 tons. In all, the Dutch shipments were made up of 12,609 tons dry and 120,329 tons wet rubber.

Sarawak and British North Borneo sent 11,464 tons or 7 per cent of the total, the former territory contributing 9,155 tons and the latter 2,309 tons, most of which was sheet and crepe. Indo-China, Siam, Burma and other countries sent 6,844 tons, 4,018 dry and 2,826 wet.

The Price Trend

At the opening of the new year a tendency to check up on the events of the past year and to prophesy for the one just entered upon is always present and under prevailing conditions seems to be more accentuated than ever. Several forecasts have been made of late and with the exception of that published by the Barbour concern, mention of which was made in a previous issue, all have an optimistic trend, all expect greatly improved prices, if not an actual boom. The unused coupons have still a somewhat depressing effect, but matters are trusted to right themselves in this regard, while for the rest any American news that indicates the possibility of increased demand for motor vehicles and tires is used to substantiate optimistic expectations and calculations. The knowledge that a greater amount of reclaim has been used in manufactured rubber in America leads to the argument that tires, for instance, will wear out sooner than would normally be the case and will have to be replaced earlier, which means a greater demand for tires and consequently rubber.

Indications like these are used to erect rosy forecasts, though in fairness it must be added that even optimists stop to take notice of hints suggesting that they may not have it quite their own way. Thus A. W. Still, former editor of the *Straits Times*, discussing the decreased outputs of native rubber says: "It is generally believed that tapping was absolutely reckless and destructive, but considering that low prices ruled during the greater part of 1926, I regard 72,000 tons (estimated, actual exports were about 80,000 tons dry) as a warning that if a period of high prices comes again we shall have to reckon with a very considerable output of native produce."

If the natives in the Dutch colonies should actually throw large amounts of rubber on the market at a period when high prices prevailed, the effect would naturally be to curb a too rapid upward movement and thus somewhat stabilize prices, in other words, a boom would to a certain extent be prevented.

Native Rubber

Apropos of native rubber, it seems that the truth about this intriguing subject will not come to light for some time yet. So little accurate data concerning this item are available and so much that is said and written on the subject is biased, in one respect at least. As a rule, too much emphasis is laid on the native habit of over-tapping. If native exploitation were as regular and intensive a business as European exploitation, over-tapping would be more nearly the check to increases in outputs than it actually is. The average native does not tap all his trees all the time. He rests them, not out of any consideration for the trees but because he frequently has other crops to attend to, or if he employs labor to tap, he has to contend with shortage of workers when prices are low since he cannot offer enough to interest labor, and when prices are high, because after they have made a certain amount of money, the laborers frequently stop working for days at a stretch in order to have a good time.

Incidentally an open-minded survey of primitive native methods in which the trees are left to fight for their existence as best they may, without any coddling by man, prompts the question whether on native estates nature may not thus be selecting a new type of Hevea tree, one that may not be a very heavy producer, but is hardy and able to withstand conditions which the higher-yielding but more sensitive estate trees could never endure? And following on this, one might ask again whether an estate rather closely planted with such hardy trees which were carefully tapped as on European estates and rested at certain intervals, might not prove to be a very good investment?

Malayan Notes

The Semambu Estate, under control of J. A. Wattie & Co., was one of several estates in the flood region which suffered considerable damage. It seems that 3,148 trees on the estate and a number of trees in new clearings planted in October and November, 1926, were destroyed or severely damaged. The trees lost represent about 5 per cent of the total number on the plantation estate.

Glenealy Plantations, Ltd., declared dividends amounting to 60 per cent during the business year just closed. It is worth while to note that their crop of 412,795 pounds was produced at all-in costs of 27.46 cents (Straits currency) per pound, from an average area of 550 acres out of a total mature area of 826 acres, thus giving a yield per acre of the area tapped of 750.65 pounds.

Major H. Gough, well-known in planting circles, particularly as a staunch advocate of bud grafting, has written a manual for the planter on *Practical Bud Grafting and Seed Selection of Hevea Brasiliensis.* The book is especially welcome, first because of the renewed interest in bud grafting here and then because there is very little literature on the subject available to the planter in Malaya.

Netherlands East Indies

In a special rubber number of *De Kroniek*, by Dr. A. Sternheim, appears an interesting review of results obtained by Dutch rubber companies in the Netherlands East Indies from 1912 to 1925. The companies considered do not include foreign concerns, enterprises where other crops beside rubber are exploited unless rubber predominates, and of course those concerns that do not publish particulars concerning their business. The number of companies that, therefore, came into consideration for treatment in the paper in question was to a certain extent limited, yet amounted to 40 in 1912, 47 in 1922, 48 in 1923, 59 in 1924 and 69 in 1925, and in 1926 contributed 25,461 tons of rubber, that is 22 per cent of the total estate output of the Netherlands East Indies.

The combined account of results in guilders (guilder=$0.40) is as follows:

	Guilders—'000 Omitted			
	1925	1924	1923	1922
Net profits	36,590	16,240	12,460	5,590
Total profits including gains from other sources	47,500	22,770	17,780	10,000
Amounts written off on concessions, estates, plantings, etc...	6,120	3,130	2,730	1,490
Addition to legal reserves	1,350	510	310	120
Dividends	18,590	7,530	5,580	2,500
Bonuses	4,930	1,770	1,110	440
Combined concessions, estates, factories, etc., booked at	128,500	111,060	96,690	94,940
Cash resources	44,210	20,970	16,530	10,540
Combined capital	123,580	90,020	77,670	75,990
Ordiary reserves	9,050	6,810	5,840	5,530
Fixed reserves including extra reserves	18,510	11,490	11,200	9,480

The various costs show a marked increase, in part due to increased taxes. In 1925 the total figure was 11,040,000 guilders against only 720,000 guilders in 1912.

In his concluding remarks the writer points out that only a few rubber companies appear to follow a sound, conservative financial policy such as is customary with sugar companies, whereas the difference in industry in no way justifies the difference in financial policy.

Eastern Java

The high prices ruling toward the end of 1925 are to a great extent responsible for the marked activity in opening up new rubber areas in Eastern Java. Thus several new estates were opened in the Besoeki district; then official approval of an application for a concession covering 6,000 bouws (bouw=1.74 acres) is being awaited in order that the work of clearing and opening up may be undertaken soon on a big scale, and finally existing estates which still have reserve lands suitable for extensions have planted up as much new land as possible.

Incidentally, the work of extending acreages is a cause of greater anxiety and worry than it has ever been, for all new plantings have to be carried out according to the very latest methods which provide, for one thing, that the new land shall be planted with alternate rows of seedlings, from selected seed, and of budgrafts. Accordingly preparations must be made early enough in order to obtain a sufficient amount of the necessary materials. This past year, it seems, there was still a shortage of budding material from approved clones, but it is expected that by the end of 1927 all demands will be met.

Some concerns prefer to leave the rows intended for budgrafts open and to plant up this space with coffee while awaiting further developments in connection with large scale experiments with budgrafts. The tapping system is practically unchanged, most estates tapping every other day. One estate has begun to tap once in three days.

In rubber preparation, formic acid has taken the place of acetic acid. Natrium silico-fluoride, strongly recommended by the British in Malaya and favorably judged in Deli, Sumatra, gave only moderately satisfactory results when tested locally.

Estate Yields

Yields during the past year were rather disappointing. In many cases, actual production failed to come up to estimated outputs. The unusually dry weather in the preceding year and the inadequate rains during the wet season probably reacted rather unfavorably on plantations, which subsequently resulted in smaller crops. In 1926, too, the dry season was rather protracted and it was not until late in the year that yields began to improve.

The rubber price, although considerably below what many expected it would be, is regarded in certain quarters as satisfactory so long as it remains fairly stable and no marked fluctuations take place, the view being that at 1 shilling 8 pence per pound producers can make a good profit, while at the same time it imposes no undue hardship on consumers.

Ceylon

A cable has been received from the Secretary of State in which he agrees to the withdrawal of the provisions of the Rubber Restriction (Amending) Ordinance which were intended to restrict the validity of export coupons issued after February 1, 1927, so that they should cease to be effective after the expiration of the quarter following the quarter in which such coupons were issued. This is considered a victory for Ceylon rubber traders who had protested vigorously against the passing of the ordinance which would have been a serious blow to Ceylon and would have placed the colony in a most disadvantageous position as compared with Malaya.

Conditions in Colombo and Singapore are totally different, Singapore being a free port and at the same time most of the rubber dealers and estate agents in control of Malayan estates have their headquarters there. Consequently, all that Malayan producers have to do is to see that their rubber reaches Singapore before the coupons to cover it become invalid. Once in Singapore, the rubber may be kept there as long as may be necessary and shipped at any time, so that neither producers nor shippers suffer any undue hardships owing to the enforcement of the ordinance. The position is different in Colombo which is not a free port but part of the restriction area. Therefore, unless the rubber was actually exported from Colombo before the expiration of the validity of the coupons, the rubber became useless to the holder.

Moreover, the ruling would have deprived the shippers of the right to hold rubber against a rising market and finally young producers would have been hard hit. The usual practice on young estates is to save up coupons for at least a year and then tap on an economic basis. The amending ordinance would have prevented this and young estates would thus have been robbed of a legitimate profit.

The *Ceylon Observer* commenting on this calls attention to the fact that there appears to be a lack of cooperation between the Secretary of State, the Governments of Ceylon and Malaya, and the rubber producers.

Anti-Restriction Views

In consequence of a letter from the Rubber Controller asking for the views of the Low Country Products Association on the desirability of continuing restriction after November 1, 1927, a full discussion of the question took place at a recent meeting of the association's committee. The result showed almost unanimous disfavor, the general opinion being that there was nothing to justify the continuation of restriction even up to next November. A sub-committee was appointed to draft a memorandum enumerating the reasons for the immediate removal of restriction.

Rubber Patents, Trade Marks and Designs

United States

February 15, 1927*

1,617,466 Float for bath soaps. Ole Tronstad, Eau Claire, Wisconsin.

1,617,504 Filter. Charles P. Shinn, New York, N. Y.

1,617,513 Sound amplifying horn. George W. Bulley, assignor to The Miller Rubber Co., both of Akron, Ohio.

1,617,537 Attachment for shampoo boards. George S. Morin, Minneapolis, Minnesota.

1,617,652 Stethoscope. Shizuo Sato, Osako-Shi, Japan.

1,617,706 Elastic closure for ladies' boots. Edwin John Flewitt, assignor to Hoyle Hoyle & Co., Ltd., both of Rawtenstall, England.

1,617,723 Air buoy for bathers. Ervin E. Roberts, San Diego, California.

1,617,870 Cushion tire. Charles Albert Snider, Atlanta, Georgia.

1,618,027 Toothbrush display stand. John J. Vogler, Douglaston, assignor to Alfred H. Smith Co., New York, both in New York.

1,618,128 Cushion tire. Max Cyrus Overman, New York, N. Y., assignor to O. & W. Co., a corporation of New York.

1,618,129 Cushion tire. Max Cyrus Overman, New York, N. Y., assignor to O. & W. Co., a corporation of New York.

1,618,147 Garter. Albert J. Carpenter, Portland, Maine.

February 22, 1927*

1,618,273 Body exerciser. John F. Davidson, St. Paul, Minnesota.

1,618,283 Boot or shoe. Benjamin Franklin Hartwell, Winchester, Massachusetts.

1,618,314 Blowout patch. Andrew J. Stephens, Kansas City, Missouri.

1,618,318 Truss. George W. Welch, assignor to Brooks Rupture Apliance Co., both of Marshall, Michigan.

1,618,347 Life preserver. James McSherry, assignor to Mary McSherry, both of St. Paul, Minnesota.

1,618,352 Tire alarm mechanism. Ulysses G. Replogle, assignor of forty one-hundredths to Hazel E. Jaquette, twenty-five one-hundredths to Frederick G. Replogle, twenty-five one-hundredths to Jesse W. Brown, and ten one-hundredths to Albert G. Jaquette, all of Toledo, Ohio.

1,618,409 Boat of the canoe type. John L. G. Dykes, Chicago, Illinois.

1,618,435 Hose supporter. Joseph Jacobs, Bronx, assignor to Webbing & Edging Co., New York, N. Y.

1,618,646 Tire for rockers. Asbury B. Fisher, Anderson, Indiana.

1,618,676 Valve for sport balls or liquid containers. Milton B. Reach, Springfield, and William W. MacDonald, Chicopee, both in Massachusetts, assignors to A. G. Spalding & Brothers, New York, N. Y.

1,618,746 Window and wind screen. Herbert Austin, Bromsgrove, England.

1,618,910 Hose supporter. Roze E. Bennett, Fort Smith, Arkansas.

March 1, 1927*

1,618,994 Playing ball. George L. Pierce and Henry V. Rau, Brooklyn, assignors to A. G. Spalding & Brothers, New York, both in New York.

1,619,028 Shock insulated rail track. Alfred S. Masury and Emil C. Fink, assignors to The Rubber Shock Insulator Co., Inc., all of New York, N. Y.

1,619,047 Window glass guide. Charles Torres Weymann, Paris, France.

1,619,067 Doorcheck strap. John R. Gammeter, Akron, Ohio, assignor to the B. F. Goodrich Co., New York, N. Y.

1,619,087 Shock insulated bumper. Frank Pampinella, Brooklyn, assignor to International Motor Co., New York, both in New York.

1,619,371 Rubber covered roll. Bruce W. Rogers and Walter L. Glass, Akron, Ohio, assignors to the B. F. Goodrich Co., New York, N. Y.

1,619,433 Punctureproof pneumatic tire. Martin L. Paulson, Fort Snelling, Minnesota.

1,619,450 Deflation alarm for pneumatic tires. Burling D. Wells, Danbury, assignor to Robert S. Blair, Stamford, both in Connecticut.

1,619,541 Button. Charles A. Rehor, Portland, Oregon.

REISSUE

16,566 Bathing shoe. Edna Sanguinet Ward, Fort Worth, Texas. Filed October 27, 1926. Serial No. 144,635. Original No. 1,593,889, dated July 27, 1926. Serial No. 45,999, filed July 25, 1925.

March 8, 1927*

1,619,812 Inner tube. Marie Nicolas Albert Develay, Paris, France.

1,619,868 Tire flap. Edison G. Hulse, assignor to Kelly-Springfield Tire Co., both of Cumberland, Maryland.

1,619,874 Corset. Adolph Lipman, assignor to Venus Brassiere Co., both of Chicago, Illinois.

1,619,886 Diagnostic apparatus. Dorsy M. Ryan, Hinton, West Virginia.

1,619,934 Stocking protector. Ada Henderson, Wampsville, New York.

1,620,036 Toy balloon. Harold Pemberton, assignor by direct and mesne asignments, to National Manufacturing Co., both of Seattle, Washington.

1,620,054. Interliner. David Baker, Los Angeles, California.

1,620,162 Elastic strapping. Horace J. Martin, Brookline, assignor by mesne assignments, to Live Leather Products, Inc., Cambridge, both in Massachusetts.

1,620,245 Device for closing air bladder of sport balls. Albert Wilhelm Turner, Hamburg, Germany.

1,620,290 Golf signal ball. Adolph J. Rubin, Brooklyn, New York.

1,620,329 Nursing bottle nipple. George H. Donaldson, West Hartford, Connecticut.

1,620,331 Toy balloon frame. Edward S. Eichenlaub, North Fairfield, Ohio.

1,620,344 Device for applying heels to shoes. Charles N. Hahn, Binghampton, New York.

1,620,415 Leakproof tank cover. Ward T. Van Orman, assignor to the Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,620,421 Life preserver. William Wilson, New York, N. Y.

1,620,426 Sanitary apron. Mabel Baxter, Belvidere, Illinois.

1,620,478 Tire holder. Frederick A. Lind, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,620,599 Arrangement for removing secretions from dental canals by suction. Robert Fust, Glogau, Germany.

Dominion of Canada

February 15, 1927

268,357 Artificial flower employing rubber tube. Charles Green, Toronto, Ontario.

268,364 Tire. William Honsberger, Buffalo, New York, U. S. A.

268,381 Horse collar with inner inflatable tube. Herman H. Ruedebusch, Elkton, South Dakota, U. S. A.

268,382 Pneumatic horse pad. Joseph A. Schinner, Greenfield, Ohio, U. S. A.

February 22, 1927

268,478 Tire valve cap. Duncan M. Anderson, Toronto, Ontario.

268,510 Pneumatic tire. Edmund Leopold Illingworth, Sutton, Eshowe, Zululand, South Africa.

268,601 Tire and rim. Alvin H. Shoemaker, Seattle, Washington, U. S. A.

March 1, 1927

268,703 Paving. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of Norman Gibson Madge, Providence, Rhode Island, U. S. A.

268,746 Automobile fender. The Reo Motor Car Co., assignee of Horace T. Thomas, both of Lansing, Michigan, U. S. A.

268,767 Bicycle wheel with solid tire. Louis Balogh and Josef Katona, assignee of one-fourth of the interest, and Imre and Ilona Pacozdi, assignees each of one-eighth of the interest, all of Niagara Falls, Ontario.

March 8, 1927

268,792 Pulley. Edward S. Avery, East Hampton, New York, U. S. A.

268,893 Golf club with rubber nipples. George William Barnes, Vulcan, Alberta.

268,968 Inflatable ball. The Wilson-Western Sporting Goods Co., assignee of Archibald J. Turner, both of Chicago, Illinois, U. S. A.

United Kingdom

February 2, 1927

262,507 Telephone test panel with ebonite base. E. A. Graham, St. Andrew's Works, Crofton Park, Brockley, London.

262,520 Vibratory massage apparatus with rubber diaphragm. C. J. Wallis, 7, Stanthorpe Road, Streatham, London.

262,574 Air cushion. D. Moseley & Sons, Ltd., and G. E. Bermingham, Chapel Field Works, Ardwick, Manchester.

262,673 Skirt with elastic insert. B. Birnbaum & Son, Ltd., and F. W. Johnston, 3B, Cannon street, St. Paul's Churchyard, London.

262,764† Endless bands for aircraft. M. A. L. Bidoire, 5 Rue Vezelay, Paris, France.

262,783† Pressure rolls for finishing fabric. G. A. Sallmann, Hohensteinerstrasse, Pleissa, near Chemnitz, Saxony, Germany.

February 9, 1927

262,839 Telephone and phonograph devices employing rubber tube. Western Electric Co., Ltd., Connaught House, Aldwych, London (Bell Telephone Laboratories, Inc., New York, N. Y., U. S. A.).

262,908 Tire tread bands. S. Haupt, 20, Bow Road, London.

262,967 Ink bottle stopper. F. F. Southby, Southend, Durham.

262,985 Motorcycle foot rest. G. D. Iles, Hillcrest, Caledonia Road, Savile Town, Dewsbury, Yorkshire.

February 16, 1927

263,190 Leather working machines with rubber covered rolls. Maschinenfabrik Turner Akt.-Ges., 20 Westendstrasse, Frankfort-on-Main, Germany.

263,203 Porous elastic fabrics. T. Vorck and P. Zimmermann, 50 Nordstrasse, Barmen, Germany.

263,232 Table game with rubber playing surface. J. G. Betjemann, 27, Campbell street, Dudley, Worcestershire.

263,361 Bat pin washers for insertion under piano keys. B. W. Brown, 35, Brooke street, Holborn, London.

263,407 Gaiters with elastic insert. F. C. Miller, 49, Avondale Road, Gorleston, Suffolk.

* Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Chemical patents will be found on page 19. Machinery and Process Patents on pages 22-23.

263,420 Hat guards. F. W. J. Wolff, 304, Union Bank Building, Victoria, British Columbia, Canada.

263,474 Hat sweat bands. W. Gruninger, Nafels, Glarus, Switzerland.

February 23, 1927

263,541 Anti-slipping treads. H. B. P. Humphries, 14, Old Queen street, Westminster.

263,551 Surgical trusses. G. Fowler, 104, Pembroke Place, Liverpool.

263,553 Electric cables. Western Electric Co., Ltd., Connaught House, Aldwych, London (Bell Telephone Laboratories, Inc., New York, N. Y., U. S. A.).

263,606 Pneumatic or solid tire for vehicle wheel. O. De Araujo, 19, Upper Brooke street, London.

263,813† Metal container with vulcanized rubber coating. International General Electric Co., Inc., 120 Broadway, New York, N. Y., U. S. A., assignee of Allgemeine Elektricitats-Ges., 2 Friedrich Karl Ufer, Berlin, Germany.

†Not yet accepted.

New Zealand

January 27, 1927

46,240 Pneumatic tire. Edward Brice Killen, 27, Queen Victoria street, London, E. C. 4, England.

Germany

439,948 Braid holder. Hugo Schmidt, Celle.

440,213 Rubber tread patch. Wilhelm G. Rudolph, Friedensstrasse 4, Hannover.

440,531 Protective tire cover. Nicolas Geranio, Rosario de Santa Fé, Argentine. Represented by F. Neubauer, Berlin W. 9.

440,680 Device for inflating pneumatic tires. Max Houben, Saint-Gilles, Brussels, Belgium. Represented by E. Moldenhauer, Düsseldorf.

440,950 Sweatband using sponge rubber. Karl Börsig, Konstanz, i. B.

441,156 Cushion tire. Emile Steenwerckers, Rochefort, France. Represented by R. Büchler, Aachen.

Trade Marks

United States

Two Kinds of Trademarks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the later act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

February 15, 1927, Act of February 20, 1905

223,847 Fancy square at the top of which is the representation of a knight on horseback and the words: "Quality Clothes," "Hartshire New York"; at the bottom of the square the words: "Bowen's Owned by Hart-Albin Billings"—raincoats, etc. Hart-Albin Co., Billings, Montana.

223,863 Agrippa—instruments, apparatus and contrivances for surgical or curative purposes. J. G. Ingram & Son, Ltd., London, England.

223,901 Fancy circle containing the letters: "D T C"—boots and shoes of leather, rubber, etc. William G. Dodge Shoe Co., Newburyport, Massachusetts.

223,903 Peter Pumpkin Shoe—boots and shoes of leather, rubber, etc. Lane Brothers Co., Boston, Massachusetts.

223,941 Representation of the sole of a shoe and which contains the word: "Kali-sten-iks"—children's shoes of leather, rubber, etc. Gilbert Shoe Co., Thiensville, Wisconsin.

224,084 Representation of a black crescent upon which are superimposed the letters: "S.H.R.," beneath the crescent the word: "Co."—rubber articles. Superior Hard Rubber Co., Butler, New Jersey.

224,095 Double circle which contains the representation of a weather vane and the name: "N E S Mills"—cotton tire fabrics, etc. New England Southern Mills, Boston, Massachusetts.

224,103 "Brassierette"—slip-over garment shields. I. B. Kleinert Rubber Co., New York, N. Y.

February 22, 1927, Act of February 20, 1905

224,220 Tribout—suspenders, braces, garters, etc. John Wanamaker Philadelphia, Philadelphia, Pennsylvania.

224,234 Supreme—heels. Edmonds Shoe Co., Milwaukee, Wisconsin.

224,245 Advance—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.

224,289 Sturdy Oak—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.

224,331 San-Togs—shoes of leather, rubber, etc. Buek & Co., Philadelphia, Pennsylvania.

224,337 Moc-Vamp—men's shoes of leather, rubber, etc. Charles A. Eaton Co., Brockton, Massachusetts.

February 22, 1927, Act of March 19, 1920

224,397 Best-Test—paper and rubber cement. Union Rubber & Asbestos Co., Trenton, New Jersey.

224,409 Mandel's—footwear. Morris Mandel, Los Angeles, California.

224,428 Dr. Lorenze—boots and shoes of leather, rubber, etc. Muskin Shoe Co., Baltimore, Maryland.

March 1, 1927, Act of February 20, 1905

224,442 Nevadite—pulp made of ground, pulverized, powdered and prepared material for use as a filler for rubber soap, etc. Union Talc Co. of Gouverneur, New York and Gouverneur, New York.

224,445 Representation of a girl and the words: "Paree" Slippers—slippers of leather, fabric, rubber, etc. Louis Cristol, doing business as Boston Shoe Store, San Antonio, Texas.

224,455 Superflite—golf balls, tees, etc. The North British Rubber Co., Ltd., Toronto, Ontario, Canada.

224,472 Representation of a hobby horse and the words: "Dobyns' Hobby-Horse School Shoes"—children's shoes and slippers of leather, rubber, etc. Dobyns' Footwear, Inc., Long Beach, California.

224,473 Representation of a horse kicking and the words: "Dobyns Kicks"—men's shoes and slippers of leather, rubber, etc. Dobyns' Footwear, Inc., Long Beach, California.

224,490 Representation of a dog above which is the word: "Huskie"—narrow woven and braided elastics. The Narrow Fabric Co., Reading and West Reading, Pennsylvania.

224,504 Double circle containing the word: "Siren"—boots and shoes. Clarence L. Harvey, doing business as Fireman's Supply Co., Belleville, New Jersey.

224,535 The words: "Heel Hug," in smaller letters above, the words: "Trade-Mark Pat. Pend," beneath, the slogan: "Pet Your Heel Save A Peel"—shoe protectors. Etta C. Litty, Kansas City, Missouri.

224,549 Representation of a runner, in the back of which is a pennant upon which is superimposed the word: "Marathon"—tires and tubes. Marathon Rubber Co., Inc., Akron, Ohio.

224,578 San-Deau—shoes of leather, rubber, etc. Buek & Co., Philadelphia, Pennsylvania.

224,599 Clear-Field—boots, shoes and overshoes. Hood Rubber Co., Watertown, Massachusetts.

224,617 Shield containing the letters: "UTH"—boots and shoes of leather, rubber and fabric. Jacob D. Chern, Philadelphia, Pennsylvania.

224,655 Square at the top of which is the monogram: "JCP," below, the word: "Majestic"—suspenders, belts, arm bands and hose supporters. J. C. Penney Co., Wilmington, Delaware, and New York, N. Y.

224,689 Faseal—gaiters with automatic fasteners. Firestone Footwear Co., Hudson, Massachusetts.

224,714 Square containing the representation of two men—shoes of leather, rubber, etc. London Shoe Co., Inc., New York, N. Y.

March 1, 1927, Act of March 19, 1920.

224,765 Fascinating Slippers—footwear. Morris Mandel, Los Angeles, California.

March 8, 1927, Act of February 20, 1905

224,809 Representation of a man in fancy costume—golf, tennis, cricket, hockey, baseballs, etc. Game Balls Co., Ltd., Brentford, England.

224,908 Representation of a fish and the word: "Apex"—rubber trolling, tubing, etc. Pacific Marine Supply Co., Seattle, Washington.

224,917 Virginia Bedell—leather, rubber, etc., shoes, etc. The Bedell Co., New York, N. Y.

224,948 Ankorite—belting for power transmission and conveying, etc. The Anchor Packing Co., Philadelphia, Pennsylvania.

224,985 Convoy—tires and tubes. C. Kenyon Co., Inc., New York and Brooklyn, New York.

224,998 Representation of an armored knight on horseback, beneath the representation the words: "Saxon Cord"—pneumatic tires. The India Tire & Rubber Co., Mogadore and Akron, Ohio.

225,025 Union—composition blanks from which are cut rubber heels and soles. O'Sullivan Rubber Co., Inc., New York, N. Y.

225,027 Circle in the center of which is the representation of a globe, outside the circle the words: "Milbury" and "Atlantic"—bathing caps, shoes, etc. The Milbury Atlantic Manufacturing Co., New York, N. Y.

Dominion of Canada

Registered

February 22, 1927

41,199 Word: "Folberth"—windshield cleaner. Folberth, Inc., Cleveland, Ohio, U. S. A.

41,207 Word: "Sphinx"—erasers, rubbers, etc. Howard Smith Paper Mills, Ltd., Montreal, Quebec.

United Kingdom

February 2, 1927

471,420 North British Parapac—rubber sheets. The North British Rubber Co., Ltd., Castle Mills, Fountainbridge, Edinburgh, Scotland.

473,009 Strippit—boots, shoes, slippers, gaiters and leggings. The Dunlop Rubber Co., Ltd., Fort Dunlop, Holly Lane, Erdington, Birmingham.

474,758 Fancy chain circle—rubber and gutta percha goods. Johnson & Johnson (Gt. Britain), Ltd., 106, Golden Lane, London, E. C. 1.

475,601 Fanciful design containing the monogram: "W H R" and the word: "Mayfair"—garters and suspenders. W. H. Reddall, Trivett's Buildings, Short Hill, High Pavement, Nottingham.

February 9, 1927

474,204 Representation of an arrow containing the word: "Hoop"—boots, shoes and overshoes. Hood Rubber Co., Watertown, Massachusetts, U. S. A. (Marks & Clerk, London, W. C. 2).

474,205 Representation of an arrow containing the word. "Hoop"—tires and inner tubes. Hood Rubber Co., Watertown, Massachusetts, U. S. A. (Marks & Clerk, London, W. C. 2).

474,439 Delafacile—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.

475,890 Circle containing the representation of a girl and the words: "The Dela Girl"—boots, shoes, slippers, gaiters and leggings. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.

475,920 Delaplay—boots, shoes, slippers, gaiters and leggings. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.

February 16, 1927

B476,012 The words: "Van Dyke—Eberhard Faber—U. S. A." preceded by the representation of a very small diamond enclosing a star—lead pencils and erasers. Eberhard Faber, 37 Greenpoint avenue, Brooklyn, New York, U. S. A. (J. E. Evans-Jackson & Co., 57-60, Holborn Viaduct, London, E. C. 1).

B476,013 The word: "Mongol" separated from the words: "Eberhard Faber U. S. A." by the representation of a small diamond enclosing a star—lead pencils, erasers and penholders. Eberhard Faber, 37 Greenpoint avenue, Brooklyn, New York, U. S. A. (J. E. Evans-Jackson & Co., 57-60, Holborn Viaduct, London, E. C. 1).

476,014 Representation of a diamond enclosing a star—lead pencils, penholders, rubber bands and erasers. Eberhard Faber, 37 Greenpoint avenue, Brooklyn, New York, U. S. A. (J. E. Evans-Jackson & Co., 57-60, Holborn Viaduct, London, E. C. 1).

February 23, 1927

B471,485 North British "Scotia"—boots, shoes and overshoes. The North British Rubber Co., Ltd., Castle Mills, Fountainbridge, Edinburgh, Scotland.

474,755 Nonox—chemical substances used in the manufacture of rubber to prevent oxidation. British Dyestuffs Corporation Ltd., 70, Spring Gardens, Manchester.

New Zealand

December 31, 1926

24,207 Representation of a fern spray beneath which are the words: "SILVER FERN" and "TRADE MARK"—bicycle and motorcycle tires and tubes, patches, handle grips, etc. George Milne, 177 Linwood avenue, Christchurch.

January 27, 1927

23,569 Fanciful design at the bottom of which is the word: "MOHAWK"—tires, tubes, casings, etc. The Mohawk Rubber Co., Akron, Ohio, U. S. A.

24,017 BUCKEYE CORD—inner tubes, solid and pneumatic tires. Kelly-Springfield Tire Co., New York, N. Y., U. S. A.

Designs

United States

72,011 Shoe sole. Term 7 years. James E. Grosjean, Lima, Ohio.

72,012 Cigar holder. Term 14 years. Isaac O. Gurnee, Butler, and Albert A. Smith, Riverdale, assignors to Superior Hard Rubber Co., Butler, all in New Jersey.

72,102 Tire casing. Term 14 years. Frederick Leopold, Jr., Harmonville, assignor to Lee Rubber & Tire Corporation, Conshohocken, both in Pennsylvania.

72,115 Tire. Term 14 years. Lawrence E. Sexton, assignor to Sears, Roebuck & Co., both of Chicago, Illinois.

72,116 Tire. Term 14 years. Lawrence E. Sexton, assignors to Sears, Roebuck & Co., both of Chicago, Illinois.

72,179. Tire. Term 14 years. Albert S. Michelson, assignor to The Akron Rubber Mold & Machine Co., both of Akron, Ohio.

Dominion of Canada

7,395 Footwear composition sheet material. Dominion Rubber Co., Ltd., Montreal, Quebec.

7,396 Footwear. Dominion Rubber Co., Ltd., Montreal, Quebec.

7,400 Children's play ball. Isabella Lowe, Caulfield, County of Bourke, Victoria, Australia.

7,424 Tires. Dominion Rubber Co., Ltd., Montreal, Quebec.

Germany

975,157 Protector for pneumatic tires. Friedrich Scherer, Oberstdorf i. Allgäu.

975,198 Rubber disks for furniture legs. Friedrich Schulze, Paulstrasse 1, Altona.

975,202 Sport belt of rubber. Firma M. Steinberg, Köln-Lindenthal.

975,203 Rubber pocket handkerchief. Firma M. Steinberg, Köln-Lindenthal.

975,217 Sectional inner tube for automobile and bicycle tires. Leonhard Bittlingmaier, Goppingen, Salach, O. A.

975,229 Bicycle cover. Hans Wilms, Torpedobootshalbflottille T 151, Kiel IV.

975,379 Rubber floor covering. Thüringer Schlauchweberei und Gummiwerke, Waltershausen, Thuringia.

975,519 Solid tire with felt or leather-like rubber foundation. Continental-Caoutchouc- und Gutta-Percha-Compagnie, Hannover.

975,665 Tube with insert, for automobiles, motorcycle tires and similar vehicles. Oskar Backer, Aderstrasse 11 and Isaak Joils, Südstrasse 70, Elberfield.

975,889 Hollow, rubber, pressure object for hats. Gummi-und Asbest-Compagnie Reinhard Stiehler & Böttger, Dresden.

975,933 Glass rubber mold with screw thread. Thüringische Glas-Instrumenten-Fabrik Alt, Eberhard & Jäger A.-G., Ilmenau.

975,951 Toy balloons. Herfurth & Ball, Berlin-Neukölln.

976,041 Rubber heel. Heinrich Ellerbrock Gummiwaren-Fabrik, Gross-Flottbek b. Altona, s. d. E.

976,368 Protected rubber piping. Hackethal-Draht und Kabel-Werke A.-G., Hannover.

976,446 Non-skid tire. Continental Caoutchouc- und Gutta-Percha- Compagnie, Hannover.

976,549 Rubberized bag, for herbs, fern, etc. R. Wächtler & Co., Dresdner Loofah-Gummiwaren-Bade-artikel-und Einlegesohlen-Fabrik, Dresden.

976,587 Rubber disks for chair legs. Nikolaus Kaczmarek, Melanchthonstrasse 52, Gelsenkirchen.

976,690 Eraser in the form of an elephant. Rohstoffgesellschaft für chemischtechnische Erzeugnisse A.-G., Berlin.

976,784 Rubber hose conduit. Hackethal-Draht-und Kabel-Werke A.-G., Hannover.

976,871 Rubberized fabric footwear. Arena Schuh-und Gamaschen-Fabrik Kurt Wolfsohn, Berlin.

976,891 Double texture rubberized fabric with silk-sheen finish on outer surface. L. Stromeyer & Co., Konstanz.

976,922 Toy figure of any kind with inflatable rubber head. Ernest Brunner, Herent, Belgium. Representative M. Mossig, Berlin S. W. 29.

976,924 Rubber handle grip. Heinrich Huntgeburth, Blücherstrasse 1, Düsseldorf.

977,074 Non-skid device for solid tires. Gummifabrik Südwest A.-G., Berlin-Stralau.

977,100 Rubber joker. Karl Erwin Martin, Oeserstrasse 23, Leipzig-Schleussig.

977,188 Rubber teething disk. Vulkan Gummiwarenfabrik Weiss & Baessler, A.-G., Leipzig-Lindenau.

977,348 Rubber joker. Vulkan Gummiwarenfabrik Weiss & Baessler, A.-G., Leipzig-Lindenau.

977,412 Tubeless pneumatic tire. Artur Ranft, Eisenach.

977,552 Rubberized fabric stocking. Carl Hans Viebach, Niederzwehren bei Kassel.

977,741 Rubber seat cushion. Mittelland-Gummiwerke A.-G., Hannover-Linden.

977,850 Legging with overshoe of rubber. Hans Engel, Geisbergstrasse 23, Berlin.

977,921 Nose tampon of sponge rubber for stopping hemorrhages. Dr. W. Mayer, Mannheim, P. 7. 16.

977,922 Sponge rubber tampon to stop the flow of blood after the removal of tonsils. Dr. W. Mayer, Mannheim, P. 7. 16.

977,930 Rubber massage roll. Firma Walther Kunde, Dresden.

978,065 Elastic rubber netting for upholstered furniture, particularly for mattresses. Bernhard Backer, Esens, Ostfriesland.

978,111 Rubber hair brush. Firma N. Brück, Landau i. d. Pfalz.

978,877 Rubber toothbrush. Bernhard Plesse, Thomaskerchhof 17, Leipzig.

Prints

United States

9,505 RAINY DAYSEE HAT PROTECTOR. Hat protectors. Evernu Rubber Heel Corporation, New York, N. Y. Published October 28, 1926.

Labels

United States

31,739 THE J.W.P. Auto enamel. Verbin C. Wogoman, doing business as Wogoman Paint & Varnish Co., Los Angeles, California. Published December 1, 1926.

NEW PATENT RULINGS

An amendment to section 4,900 of the United States Revised Statutes relating to the marking of patented articles provides that on all articles manufactured under a patent issued after April 1, 1927, the patent markings shall consist of the word "Patent" together with the number of the patent. As to patents issued prior to that date it is optional to mark in the new way or to follow the old practice of marking the product "Patented" together with the day and year of patent.

The present filing fee of $20 will, after April 14, 1927, be a minimum fee to which must be added $1.00 for each claim in excess of twenty. In the same way the present final fee of $20 will be a minimum fee with an additional $1.00 for each claim over twenty in the patent as issued.

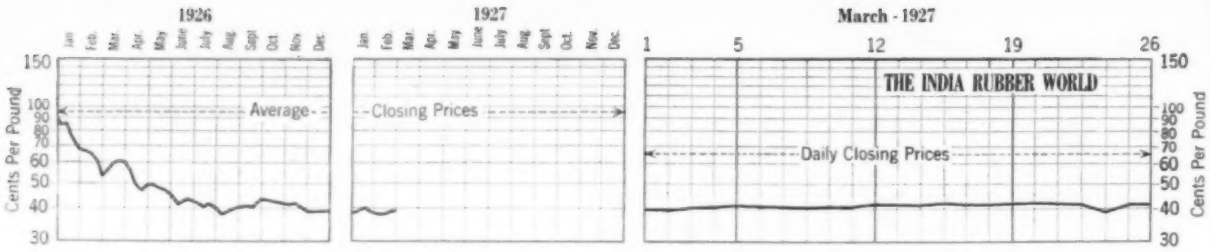
TIRE PRODUCTION INVENTORY AND SHIPMENTS—1925 AND 1926

Increases in production and shipments of balloon casings and tubes, with declines in other types, including solid and cushion tires, are particularly evident in any analysis of the 1925 and 1926 figures for tire production and shipments. In the tabulation below it will be noted that the 1926 production of all types of pneumatic casings totaled 46,103,832 as compared with 45,633,316 for 1925, the figures for balloon casing production during the two years being 21,824,489 and 15,567,644 respectively. Shipments of balloon casings in 1926 totaled 20,375,843 as against only 14,628,137 for 1925. Figures for shipments of all classes of pneumatic casings remain practically unchanged: 44,253,280 for 1926 and 44,525,678 for 1925.

As compared with 1925, there was a falling-off in 1926 in the consumption by the tire manufacturing industry of both cotton fabric and crude rubber, the totals for cotton fabric being: 1924, 142,415,356 pounds; 1925, 168,295,927; and 1926, 165,963,182. Estimates for crude rubber were: 1924, 453,845,546 pounds; 1925, 552,389,272; and 1926, 518,043,062. The present year has however begun auspiciously, the January figures for cotton fabric at 14,358,414 pounds and crude rubber at 44,078,473 pounds being considerably higher than the corresponding December records of 11,592,667 and 37,117,457 pounds respectively, or the November totals of 12,421,923 and 36,736,656 pounds.

	Totals, 1925			Totals, 1926		
CASINGS, TUBES, AND SOLID TIRES	Inventory*	Production	Total Shipments	Inventory†	Production	Total Shipments
Pneumatic casings—all types	6,106,405	45,633,316	44,525,678	7,482,055	46,103,832	44,253,280
Inner tubes—all types	8,484,608	61,960,526	60,744,015	12,150,063	57,463,807	53,694,061
Balloon casings	1,775,428	15,567,644	14,628,137	3,141,505	21,824,489	20,375,843
Balloon inner tubes	1,995,277	16,096,518	14,856,699	4,133,865	23,502,653	21,366,799
High pressure cord casings	3,723,296	23,631,807	22,685,933	4,047,557	21,699,727	21,359,511
High pressure inner tubes	6,489,331	45,864,008	45,887,316	8,016,198	33,960,154	32,327,256
Solid and cushion tires	148,080	758,900	800,395	164,294	562,193	532,487

* As of December 31, 1925. † As of December 31, 1926.
Rubber Association figures representing 75 per cent of the industry.



Ratio Graph of New York Closing Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York Outside Market

THE crude rubber market for March was strong and active with prices steadily advancing because of the spring activity of rubber manufacturing in all lines, more particularly of tires. On March 1 the spot price of ribs was 39⅞ cents; on the 12th 41⅞ cents; in the 21st 42.0 cents and on the 26th 41¼ cents.

Domestic factories are operating at capacity in all divisions of the industry, and are actively buying both spot and near-by, especially May-June with some interest in July-September positions. Higher prices prevailed in the Singapore and far eastern markets than in London and New York, indicating active buying interest. The decline in London stocks during the week ended March 19 was due to increased demand by English and European manufacturers. Domestic rubber manufacturers look with unconcern on the probability of a further reduction of 10 per cent effective May 1 on exports under the British restriction act. In that event the exportable allowance will become 60 per cent of assessed standard production. Stocks in the United States, London and the Far East are about 175,000 tons which accounts for the fact that regardless of further restriction of exportable allowance for the quarter beginning May 1, domestic manufacturers expect the present prices of rubber to sag rather than advance.

In the week ended February 26 a holiday occurred early in the week. Following this, London and Singapore cables indicated firmer prices in those markets and in Java. Domestic factory demand became better and the price advanced. All c. i. f. orders were taken up promptly and the market became steady and firm. The week closed with spot ribs at 39 cents buyers, 39½ cents sellers. Paras were rather quiet and slightly firmer. Balatas were neglected with prices at very low level and good supply available.

During the week ended March 5 the market was extremely firm with active buying on the part of both dealers and factories. This activity was attributed to the spring starting up of the factories and the relatively small arrivals in the short month of February. The week opened with ribs at 39¾ cents buyers, 40 cents sellers and closed at 41 cents buyers, 41½ cents sellers. Paras continued firmer through the week. Balatas were depressed, and prices were low.

The market of the week ended March 12 was quiet and steady the first two days and then turned easier. Considerable factory inquiry for near-by combined with firmer London and Singapore cables caused prices to rise during the remainder of the week. The sustained factory demand caused the market to close the week firm and high with more buyers than sellers. The advance for the week was about one cent on ribs as follows: On March 7, 40½ cents buyers, 40¾ cents sellers and on March 12, 41¾ cents buyers and 42 cents sellers. Paras were in lessened demand but firmer in price.

The market of the week ended March 19 held very active with advances well maintained. All the offers from the primary markets were higher than the New York market. In spite of a fair demand from consumers, prices during the week did not advance sufficiently to warrant the importers buying shipment rubber. Toward the end of the week factory business became very dull but regardless of this the market remained steady. Paras and balatas continued featureless and somewhat dormant.

The week ended March 26 began with prices firm at 42 cents buyers, 42¼ cents sellers. From these prices there was a slight decline until Thursday the 24th when the market broke to 40¾ cents buyers, 41 cents sellers, because of considerable liquidation of losses, covering by short interests and lessening of factory buying. The week closed in a waiting mood with little demand for nearby rubber. The primary markets were holding strong and higher than the New York market which made trading difficult. Prices on March 26 had regained some of the loss of the 24th and were 41 cents buyers, 41¼ cents sellers. Paras and balatas were quiet.

Importations of all grades in February were 27,600 tons, compared with 34,067 tons one year ago. Plantation arrivals for February were 25,326 tons compared with 31,832 tons one year ago. Total importations of plantation rubber for two months ended February 28 were 67,972 tons, compared with 68,204 tons for the corresponding period of 1926. Total importations of all grades of rubber for the two months ended February 28 were 73,336 tons compared with 72,764 tons for the corresponding period of 1926. Arrivals of crude rubber March 1 to 23 were 26,295 tons. Arrivals for the full month of March are estimated at 39,500 tons, compared with 29,446 tons for February.

RUBBER AFLOAT TO THE UNITED STATES

(Figures in Long Tons)

Week ended	British Malaya	Ceylon	East Indies	London and Liverpool	Totals
February 26	5,071	45	1,827	570	7,513
March 5	5,759	2,091	1,536	325	9,711
March 12	6,146	1,352	1,968	198	9,664
March 19	6,417	908	2,026	272	9,623

New York Open Market—Spot Closing Rubber Prices—Cents Per Pound

Plantations	February, 1927							March, 1927													
Sheet	21	*22	23	24	25	26	28	1	2	3	4	5	7	8	9	10	11	12	14	15	16	17	18	19
Ribbed smoked	38⅝	....	39	38⅞	39⅛	39¼	39¼	39⅞	39⅝	40⅛	40¾	41⅛	40⅞	40⅝	40⅜	40¾	41½	41⅞	41½	41⅜	41⅞	41¾	41¾	41⅞
Crepe											41½	41½	41¼	41⅛	41	41⅜	41⅞	42⅛	41⅜	41¾	41⅞	42	42	42⅛
First latex	39⅛	....	39¼	39¼	39½	39⅞	40⅛	40¼	40	40⅛	38⅛	38⅛	38⅛	38⅛	37½	38⅛	38⅜	39⅛	38⅞	38⅞	39⅛	39⅛	39⅛	39⅛
No. 2 blanket	36⅛	....	36⅛	36	36	36½	37⅜	37⅛	37¼	37½	37⅛	37⅛	37⅛	37⅛	37	37⅛	37⅛	38	38⅛	38¼	38⅜	38⅜	38¾	38¾
No. 3 blanket	35⅝	....	35⅝	35⅜	35⅜	36	36⅛	36½	36¼	37	36	36⅜	36½	36½	36⅛	36½	37¼	37⅜	37⅜	37⅜	37⅝	37½	37½	37⅝
No. 4 blanket	34½	....	34⅝	34⅛	34⅜	34¾	35	35¼	35	35⅜	35¼	35¼	35¼	35¼	35	35¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼	36¼
Thin clean brown	35½	....	35⅜	35⅜	35½	35¾	36⅛	36⅜	36¼	37	37⅜	37⅞	38⅛	37⅞	37⅜	37⅜	37⅞	38½	38⅛	38¾	38¾	38⅞	38⅞	38⅞
Rolled brown	31⅝	....	31½	31⅜	31⅝	32¼	32½	32½	32⅜	33	33½	33⅜	34⅛	34	33⅜	34⅛	34⅜	34⅜	34⅛	34½	35⅛	35	34⅞	35⅛
Off latex	38⅜	....	38¼	38⅜	38⅞	39¼	39¼	39¼	39½	39⅞	40½	40¾	40¾	40⅝	40½	40¾	41⅜	41½	41⅜	41⅜	41⅜	41⅜	41½	41¾

* Holiday.

New York Quotations

Following are the New York spot and future rubber quotations for one year ago, one month ago and March 26, the current date:

Plantation Hevea	March 25, 1926		February 24, 1927		March 26, 1927	
Rubber latex (Hevea)....gal.	$2.00	@	$1.50	@	$1.50	@
CREPE						
First latex crepe, spot.....	.60½	@	.39½	@.39¾	.41¾	@
Mar.	.60	@	.39¾	@	.41¾	@
Apr.-June	.59½	@	.40¼	@	.42¼	@
July-Sept.	.58½	@	.41	@	.43	@.43¼
Oct.-Dec.	.57½	@	.42	@	.44	@
Off latex, spot.....	.59½	@	.39	@	.41¼	@.41½
Amber No. 2, spot.....	.58	@	.36½	@	.39	@
Mar.	.58	@	.36½	@	.39	@
Apr.-June	.57	@	.37	@	.39¼	@
July-Sept.	.56	@	†.37	@		@
Amber No. 3, spot.....	.57	@	.36	@	.39	@
Brown, thin, clean.....	.57	@	.36	@	.39	@
Brown, specky.....	.56	@	.35½	@	.38	@
Brown, roll.....	.52	@	.32	@	.35	@
Sole crepe	.95	@	.62	@		@
Sheet						
Ribbed, smoked, spot.....	.59	@	.39	@	.41½	@.41¾
Mar.	.59	@	.39¼	@	.41½	@.41¾
Apr.-June	.58½	@	.40	@	.42	@.42½
July-Sept.	.57	@	.41	@	.42¾	@.43
Oct.-Dec.	.56	@	.42	@	.44	@
East Indian						
PONTIANAK						
Banjermassin	.17	@.19½	.10½	@	.10	@
Pressed block	.32	@.36	.20	@	.15	@
Sarawak		@		@	.10	@
South American						
PARAS						
Upriver, fine.....	.54	@	.30	@	.33½	@
Upriver, fine.....	*.74	@	*.41	@	*.44	@
Upriver, medium.....	.48	@	.25	@	.29	@
Upriver, coarse.....	.41½	@	.23	@	.25	@
Upriver, coarse.....	*.60	@	*.34½	@	*.38	@
Islands, fine.....	.50	@	.27	@	.30	@
Islands, fine.....	*.66	@	*.39	@	*.43	@
Acre, Bolivian, fine.....	.55	@	.31	@	.44½	@
Acre, Bolivian, fine.....	*.75	@	*.42	@	*.44½	@
Beni, Bolivian.....	.56	@	.31	@	.45	@
Madeira, fine.....	.56	@	.31	@	.44	@
Peruvian, fine.....	.53	@	.29	@	.43	@
Tapajos, fine.....	.51	@	.27	@	.41	@
CAUCHO						
Upper Caucho ball.....	.43½	@	.25	@	.28	@
Upper Caucho ball.....	*.62½	@	*.35½	@	*.39	@
Lower Caucho ball.....	.40	@	.23	@	.25	@
Maniçobas						
Ceará negro heads.....	.45	@	.24	@		@
Ceará scrap	.25	@	.14	@		@
Maniçoba, 30% guarantee.	.40	@	.28	@		@
Mangabiera, thin sheet....	.41	@	.28	@		@
Centrals						
Central scrap.....	.40	@	.23	@	.26½	@
Central wet sheet.....	.27	@	.16	@	.20	@
Corinto scrap	.41	@	.22¾	@	.26½	@
Esmeralda sausage.....	.40	@	.23	@	.26	@
Guayule						
Duro, washed and dried...	.48	@	.31	@	.33	@
Gutta Percha						
Gutta Siak.....	.35	@.38	.25	@	.23	@
Gutta Soh.....	.30	@.35	.46	@	.45	@
Red Macassar.....	3.00	@	3.00	@	3.00	@
Balata						
Block, Ciudad Bolivar....	.64½	@	.39	@	.37	@
Colombia	.53½	@	.38	@	.37	@
Manaos block.....		@		@	.40	@
Panama		@		@		@
Surinam, sheet.....	.74	@.75	.66	@	.66	@
amber.....	.78	@.80	.73	@	.70	@
Chicle						
Honduras	‡.64	@	‡.56	@	‡.56	@
Yucatan, fine.....	‡.65	@	‡.56	@	‡.56	@

*Washed and dried crepe. Shipment from Brazil.
†Nominal. ‡Duty paid.

New York Open Market—Spot Closing Rubber Prices—Cents, Per Pound

Plantations	March, 1927 21	22	23	24	25	26
Sheet						
Ribbed smoked.....	42	41¾	41⅜	40⅞	41¼	41⅜
Crepe						
First latex.....	42¾	42⅛	41¾	41	41⅝	41¾
No. 2 blanket.....	39¼	38⅞	38⅜	38⅛	39	39⅛
No. 3 blanket.....	39	38½	38⅛	38⅛	38⅝	38⅝
No. 4 blanket.....	37⅜	37½	37⅛	37¼	37¾	37½
Thin clean brown.....	38⅞	38⅝	38¼	38	38⅜	38½
Rolled brown.....	35⅜	35⅛	35¼	34¾	34⅞	35¼
Off latex.....	41¾	41¾	41⅝	40⅜	40⅞	41⅛

London

During the week ended February 26 the market was generally dull and business was moderate. A loss of ⅛ pence by spot on Monday was recovered on Wednesday and again lost on Thursday. The week closed with the market quiet and steady, with nearby positions unchanged.

The market was steady the first week in March with business moderate, and a slight increase in the spot price as the week advanced. On Monday it closed at 19¾ pence and on Saturday an advance to 20⅜ pence was registered at the close of business.

The second week opened with a slight advance in price. This was followed by dullness and all positions sagged ⅛ pence. The week closed with prices barely steady at ⅛ pence advance. The closing price of spot on Monday was 20⅜ pence and on Saturday 20¼ pence.

The third week showed the same opening and closing prices as in the second week. Business was very inactive and the market dull and generally steady.

London market conditions for the week ended March 26 were essentially like those prevailing in the previous week. Business was generally dull with spot and nearby declining. The week closed with spot and April at 20¼ pence.

London stocks increased weekly from February 19 to March 12. In the week ended March 19 stocks decreased 216 tons and was the first decline in many months but was much more than offset by the gain of 1,867 tons the week ended March 26. The weekly record is as follows: February 26, 58,659 tons; March 5, 59,945 tons; March 12, 61,516 tons; March 19, 61,300 tons; March 26, 63,167 tons.

Singapore

During the first three of the five weeks period between February 21 and March 26 inclusive there was practically no spot rubber available in the Singapore market. Business was fair and steady. March rubber advanced from 19 pence on February 21 to 20⅛ pence on March 23. April, May and June closed firm on March 26 ⅛ pence up at 20¼ pence.

British Malaya

Rubber Exports

An official cablegram from Singapore to the Malay States Information Agency, 88 Cannon street, London, E. C. 4, England, states that the amount of rubber exported from British Malaya during the month of February, 1927, totaled 27,528 tons. The amount of rubber imported was 11,697 tons, of which 9,491 tons were declared as wet rubber. The following are comparative statistics:

	1926 Gross Exports Tons	1926 Foreign Imports Tons	1927 Gross Exports Tons	1927 Foreign Imports Tons
January	30,452	10,237	34,946	14,995
February	30,440	8,306	27,528	11,697
Totals.....	60,892	18,543	62,474	26,692

Note—The above figures represent the totals compiled from declarations received up to the last day of the month for exports from and imports to all ports of British Malaya and not necessarily the actual quantity shipped or landed during that month.

Distribution

The following is a comparative return of distribution of shipments during the months of January and February, 1927:

	January, 1927 Tons	February, 1927 Tons
United Kingdom	7,288	7,224
United States	23,069	16,672
Continent of Europe.....	2,327	1,839
British Possessions	595	502
Japan	1,664	1,285
Other foreign countries.....	3	6
Totals.....	34,946	27,528

Low and High New York Spot Prices

Plantations	1927*	March 1926	1925
First latex crepe...	$0.40 @$0.42½	$0.53½ @$0.64	$0.38½ @$0.43¾
Smoked sheet, ribbed	.39½ @ .42½	.52¼ @ .63	.38⅛ @ .43
PARAS			
Upriver, fine	.32 @ .35	.44 @ .59½	.31½ @ .36¼
Upriver, coarse.....	.24½ @ .27½	.35 @ .45	.26½ @ .29¼
Islands, fine	.28½ @ .31¾	.40 @ .54	.30½ @ .34
Cametá	.....	.30 @ .39	.16 @ .17

* Figured to March 25, 1927.

The Rubber Exchange of New York, Inc.

Trading on the Rubber Exchange from February 21 to March 26 inclusive resulted in the sale of 6,054 contracts, equivalent to 15,135 long tons, as compared to 3,134 contracts and 7,835 tons the previous month. American rubber consumption in March is estimated at 34,000 tons, which is 4,400 tons or nearly 33 per cent more than the actual consumption in February.

This is due in part to the longer month but chiefly to the increased activity in tire production by enlargement of the manufacturing schedules. In general the market for futures was active which induced considerable buying interest especially for May-June and late summer positions. The high on futures from April to October ranged from 39.3 cents to 43.30 cents.

During the last week of February closing on the 26th, the market showed a considerable increase in activity over the few preceding weeks. Tire factories had begun to advance schedules and required additional rubber. There was no decided movement of the market either way. Advances were recorded, however, in the prices of all positions. March and April closed the week at 39.0 and 39.6 cents respectively, July and October at 40.9 and 41.9 cents respectively.

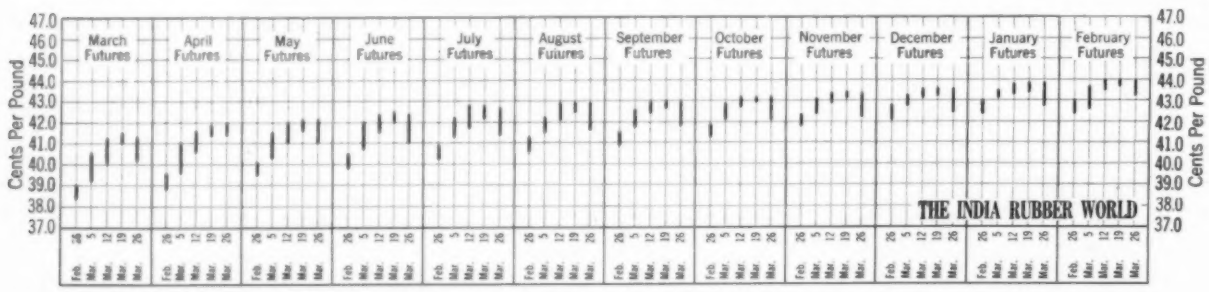
The week of March 5 closed with prices improved and very steady. There was considerable activity and increased buying by tire manufacturers. The market has developed notable resistance in view of the statistical position of the past few months. Closing prices of the week were: March 40.6 cents, April 41.0 cents, July 42.3 cents, October 42.9 cents.

In the week March 7 to 12 the market held very steady. There was a slight reaction due to profit taking and selling pressure. The factory demand was withdrawn when the price advanced, indicating that London stocks are strongly held. Future prices closed as follows: March 41.3 cents, April 41.6 cents, July 42.8 cents and October 43.2 cents.

During the week from March 14 to 19 the market was steady, 1,139 contracts equivalent to 2,847½ tons were the week's transactions. Future prices made fractional advances, closing as follows: March 41.5 cents, April 41.8 cents, July 42.7 cents, October 43.2 cents.

The week ended March 26 was a very active one although the number of contracts fell 18 per cent under the average of the past 5 weeks, totaling 995 contracts or 2,487½ tons as compared with the weekly average referred to of 1,211 contracts or 3,027½ tons. This drop was attributed to rumor that a marked slowing up had occurred in tire production in the Akron district. The consequent recession in price, however, attracted renewed buying interest on the part of manufacturers and prices regained much of their lost ground, April closing on Saturday at 41 cents, one cent down from the previous Monday, while the other positions closed at one-half cent or less under Monday's prices.

New York Rubber Exchange—High and Low Monthly Futures—Cents Per Pound



The Rubber Exchange of New York, Inc.

Daily Market Futures—Ribbed Smoked Sheets—Closing Prices—Cents Per Pound

	February							March																					
1927	21	22*	23	24	25	26	28	1	2	3	4	5	7	8	9	10	11	12	14	15	16	17	18	19	21	22	23	24	25	26
Feb.	38.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mar.	38.4	...	38.7	38.5	38.7	39.0	39.3	39.3	39.2	39.9	39.9	40.6	40.4	40.2	40.1	40.2	40.5	41.3	41.3	41.2	41.3	41.0	41.1	41.5	41.3	41.2	41.2	40.2	...	...
Apr.	38.8	...	39.2	39.0	39.0	39.6	39.6	39.8	39.7	40.4	40.7	41.0	40.9	40.8	40.6	40.9	41.2	41.6	41.6	41.4	41.9	41.6	41.5	41.8	42.0	41.6	41.4	40.7	40.9	41.0
May	39.5	...	39.8	39.7	39.8	40.1	40.4	40.4	40.3	40.9	41.2	41.5	41.4	41.3	41.0	41.4	41.7	42.0	41.7	41.6	42.1	41.8	41.8	42.1	42.2	41.9	41.6	41.0	41.2	41.7
June	39.8	...	40.2	40.1	40.2	40.5	40.7	40.9	40.9	41.4	41.6	42.0	41.7	41.6	41.5	41.6	42.0	42.4	42.0	42.0	42.5	42.1	42.1	42.0	42.4	42.1	41.8	41.0	41.5	42.0
July	40.2	...	40.6	40.5	40.7	40.9	41.3	41.2	41.2	41.8	41.8	42.3	42.0	41.8	41.7	42.0	42.4	42.8	42.4	42.2	42.8	42.5	42.4	42.7	42.7	42.4	42.0	41.4	41.7	42.3
Aug.	40.6	...	41.0	40.9	41.1	41.3	41.5	41.6	41.6	42.1	42.1	42.3	42.2	42.1	42.1	42.3	42.6	42.9	42.5	42.5	42.9	42.7	42.6	42.9	42.9	42.7	42.3	41.6	41.8	42.5
Sept.	40.9	...	41.0	41.3	41.2	41.5	41.7	41.8	41.8	42.3	42.3	42.6	42.4	42.5	42.5	42.7	42.7	43.0	42.7	42.7	43.0	42.9	42.9	43.0	43.0	42.7	42.6	41.8	42.0	42.6
Oct.	41.3	...	41.6	41.6	41.6	41.9	42.1	42.1	42.1	42.5	42.6	42.9	42.7	42.8	42.7	43.0	43.0	43.2	42.9	42.9	43.1	43.1	43.1	43.2	43.2	43.0	42.8	42.1	42.3	43.1
Nov.	41.8	...	42.0	42.0	42.0	42.4	42.4	42.4	42.4	42.7	42.7	42.1	42.9	42.9	42.9	43.2	43.2	43.4	43.1	43.1	43.3	43.2	43.3	43.4	43.4	43.2	43.1	42.3	42.5	43.3
Dec.	42.1	...	42.4	42.4	42.4	42.7	42.7	42.7	42.7	42.9	42.9	43.3	43.1	43.1	43.1	43.4	43.4	43.6	43.2	43.3	43.5	43.2	43.5	43 6	43.6	43.4	43.3	42.5	42.7	43.5
1928																														
Jan.	42.4	...	42.8	42.8	42.8	43.0	43.1	43.1	43.1	43.2	43.2	43.5	43.3	43.3	43.3	43.6	43.6	43.8	43.5	43.5	43.7	43.4	43.6	43.8	43.8	43.6	43.5	42.7	43.0	43.7
Feb.	...	...	...	...	...	...	...	43.5	43.5	43.5	43.5	43.7	43.5	43.5	43.5	43.8	43.8	44.0	43.7	43.7	43.9	43.6	43.7	44.0	44.0	43.8	43.7	42.9	43.2	43.9

* Holiday.

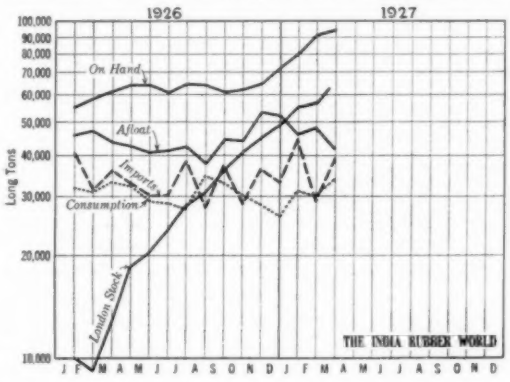
The following crude rubber importers, dealers, and brokers are listed in our Buyers' Directory. For complete information see Index of Advertisers on Page 106

Araujo, J. G. & Co., Manaos, Brazil.
Astlett, H. A., & Co., New York, N. Y.
Baird Rubber & Trading Co., New York, N. Y.
Buckleton & Co., Ltd., Liverpool, England.
Chalfin, Joseph, & Co., Inc., New York, N. Y.
Chipman, R. L., New York, N. Y.
Dunbar, F. W., & Co., Inc., New York, N. Y.
Dunbar, J. Frank, Co., Inc., New York, N. Y.
Hankin, George, & Co., London, England.
Hardy, R. S., Co., New York, N. Y.
Henderson Brothers & Co., Inc., New York, N. Y.
Hentz, H. & Co., New York, N. Y.
Hirsch, Adolph, & Co., New York, N. Y.
Jacoby, Ernest, Boston, Massachusetts.
Littlejohn & Co., Inc., New York, N. Y.
Muehlstein, H. & Co., New York, N. Y.
Nordmann, Rossmann & Co., Hamburg, Germany.
Wilson, Charles T., Co., Inc., New York, N. Y.

Imports, Consumption and Stocks

The graph below covers completely the rubber supply, consumption and stocks for 1926 and the first quarter of 1927.

Stocks of crude rubber in the United States on February 28 were 91,086 tons. During March this amount rose to about 95,600 tons on March 31 due to the gain of estimated March arrivals



U. S. Imports, Consumption, Stocks, 1926-27

over estimated March consumption. These estimates were, arrivals 39,500 tons, consumption 34,000 tons.

London stocks increased 4,361 tons between February 12 and March 19 and on the latter date were reported as 61,300 tons, a decline of 216 tons from the week previous. This is the first decline in a year.

UNITED STATES CRUDE RUBBER IMPORTS, CONSUMPTION AND STOCKS

1925	Imports Tons	Consumption Tons	Stocks On Hand† Tons	Stocks Afloat† Tons	London Tons	Singapore and Penang Tons†
Twelve months.... 1926	384,837	389,136	51,000*	48,000*	.....	.....
Twelve months.... 1927	411,900	358,415	72,510*	52,019*	.....	.....
January	45,736	31,500	76,171	45,218	54,786	26,443
February	29,446	29,000	76,000	48,000	56,962	26,766
Mar. (estimated)..	39,500	34,000	91,086	42,166	63,300‡‡	.....

* December 31, 1925 and 1926.
† The first of each month.
‡‡ March 19, 1927.

Ceylon Rubber Exports from Jan. 1 to Dec. 31, 1926

	Tons
To United Kingdom	18,260.36
Continent	2,776.96
Australia	1,083.21
America	36,441.46
Egypt	7.11
Africa	80.47
India	7.32
China	2.46
Japan	140.19
Total	58,799.54

CEYLON ANNUAL EXPORTS, 1920-1924

	Tons
For the same period last year	45,697.19
For the year 1924	37,351.13
1923	37,111.88
1922	47,260.00
1921	40,210.31
1920	38,971.59

Plantation Rubber Exports from Malaya

January 1 to January 31, 1927

	From Singapore Tons	From Penang Tons	From Malacca Tons
To United Kingdom	951.92	937.14	848.11
British Possessions	369.59	4.00	7.54
Continent of Europe	1,364.07	270.70	236.97
United States	14,435.74	2,405.39	1,345.53
Japan	948.36	373.00	292.50
Other countries	2.94	.....	.....
Totals	18,072.62	3,990.23	2,730.65

Reclaimed Rubber

Reclaimers are operating at nearly their full increased capacity. Consuming demand for reclaim products continues very active. Present indications are that reclaim consumption will reach an enormous total this year. Prices on practically all the listed market grades show a decline from the quotations, one month ago, despite the upward trend of crude rubber during March. This apparent reversal of the usual order in this regard is explained by the fact that the reclaimers are passing on to the rubber manufacturing industry the benefit of the reductions, resulting from lower operating costs, due to process developments and continuous operation on capacity output.

That rubber goods manufacturers, as well as reclaimers, are intent on the full technical development of reclaims in compounding is seen in the fact that inner tubes are now being made containing various proportions of reclaim, equalling in service most so-called first grade tubes. These tubes, of course, contain an accelerator, such as Grasselerator 808, well adapted to react with high tensile reclaims.

New York Quotations

March 26, 1927

Auto Tire	Specific Gravity	Price Per Pound
Black	1.21	$0.08¼ @ $0.09
Black, washed	1.18	.10½ @ .10¾
Black selected tires	1.20	.10 @ .10½
Dark gray	1.35	.12¾ @ .13¼
Light gray	1.38	.13½ @ .14
White	1.40	.16½ @ .17
High Tensile		
Super-reclaim, No. 1 Black	1.20	.18 @ .18½
No. 2 Black	1.20	.15½ @ .16
High tensile red	1.20	.15 @ .15½
Shoe		
Unwashed	1.60	.08¼ @ .08⅝
Washed	1.50	.11 @ .11⅜
Tube		
No. 1	1.00	.18½ @ .19½
No. 2	1.18	.14½ @ .15½
Miscellaneous		
Red	1.35	.15 @ .15½
Truck tire, heavy gravity	1.55	.08½ @ .09
Truck tire, light gravity	1.40	.09 @ .09½
Mechanical blends	1.60	.08 @ .08½

The following reclaimed rubber dealers are listed in our Buyers' Directory. For complete information see Index of Advertisers on Page 106.

Bloomingdale Rubber Co., New York, N. Y.
Central Rubber Reclaiming Co., Findlay, Ohio.
Clapp, E. H., Rubber Co., Boston, Massachusetts.
Defiance Rubber Co., Defiance, Ohio.
Manhattan Rubber Manufacturing Co., Passaic, New Jersey.
Nearpara Rubber Co., Trenton, New Jersey.
New Jersey Rubber Co., Lambertville, New Jersey.
Pequanoc Rubber Co., Butler, New Jersey.
Philadelphia Rubber Works, Philadelphia, Pennsylvania.
Rubber Regenerating Co., Naugatuck, Connecticut.
Somerset Rubber Reclaiming Works, New Brunswick, New Jersey.
Stedman Rubber Products Co., South Braintree, Massachusetts.
U. S. Rubber Reclaiming Co., Inc., New York, N. Y.
Vulcan Recovery Co., Trenton, New Jersey.
Xylos Rubber Co., Akron, Ohio.

The Market for Rubber Scrap

There is a distinct shortage in most lines of rubber scrap, and collections are poor. No large accumulations are being made as the reclaimers' demands absorb collections as fast as gathered. The pronounced scarcity thus caused has advanced quotations on all except a few grades.

AIR BRAKE HOSE. Both grades have advanced from $2 to $3 a ton because of the scarcity induced by increased demand.

BOOTS AND SHOES. The reclaiming demand is seasonable, fair in amount and better on black than on colored grades. Production of colored rubber footwear has become sufficiently large as to impair the supply of black shoes and cause the latter to advance somewhat in price.

INNER TUBES. Collections are less plentiful.

TIRES. Pneumatic tires are somewhat scarce. Collections are restricted and pass immediately into the hands of reclaimers at better prices than one month ago. Truck tires are in good supply. Consumption of inner tubes and tires is exceptionally good.

Quotations for Carload Lots

March 26, 1927

Boots and Shoes			
Boots and shoes, black	lb.	$0.02¼ @	$0.02¼
Red and white	lb.	.01½ @	.01¾
Trimmed arctics, black	lb.	.01¼ @	.01½
Untrimmed arctics	lb.	.01 @	.01¼
Tennis shoes and soles	lb.	.01 @	.....
Hard Rubber			
No. 1 hard rubber	lb.	.10 @	.11
Battery jars, black compound	lb.	.02 @	.02½
Inner Tubes			
No. 1, floating	lb.	.09¼ @	.09¾
No. 2, compounded	lb.	.07 @	.07½
Red	lb.	.06½ @	.06¾
Mixed tubes	lb.	.07 @	.07¼
Mechanicals			
Mixed black scrap	lb.	.01 @	.01¼
Heels	lb.	.00¾ @	.00¾
Hose, air-brake	ton	36.00	@39.00
regular soft	ton	20.00	@.....
No. 1 red	lb.	.02 @	.02¼
No. 2 red	lb.	.01½ @	.01⅝
White, druggists' sundries	lb.	.04 @	.04½
Mechanical	lb.	.01¼ @	.01⅜
Tires			
Pneumatic Standard—			
Mixed auto tires with beads	ton	26.50	@27.50
Beadless	ton	36.00	@37.00
White auto tires with beads	ton	42.00	@43.00
Beadless	ton	53.00	@54.00
Mixed auto peelings	ton	35.00	@35.50
Solid—			
Mixed motor truck, clean	ton	34.00	@36.00

EXPORTS OF SCRAP RUBBER FROM THE UNITED STATES DURING 1926, according to the Department of Commerce, totaled 29,842,702 pounds, value $1,946,894, as compared with the 1925 figures of 30,951,479 pounds, value $1,615,863.

The following scrap rubber dealers are listed in our Buyers' Directory. For complete information see Index of Advertisers on Page 106.

Birkenstein, S., & Sons, Chicago, Illinois.
Chalfin, Joseph, & Co., Inc., New York, N. Y.
Cummings, Wm. H., & Sons, New York, N. Y.
Muehlstein, H., & Co., Inc., New York, N. Y.
Norton, M., & Co., Medford, Massachusetts.
Schnurmann, J., London, England.
Weber, Hermann, Hoboken, New Jersey.

Metal Market Review

Decided quietness has prevailed during March in most of the markets, with little change in prices. Zinc quotations have, however, shown a slight decline, while prices for tin are a little lower, although there has been an active market. Steel production has, however, been steadily increasing during March, the ingot output being estimated at more than 90 per cent of capacity, the February figure being 86.45 per cent and that of January 81.54 per cent.

ALUMINUM. The market has remained fairly active, with quotations unchanged. Prices in London also continue firm at £105 per gross ton, this stability said to be due to the operations of the new European aluminum cartel.

ANTIMONY. The market continues to weaken, the prices for spot delivery of Chinese metal being quoted during the middle of March at 12.25 to 12.50 cents, New York, duty paid, with futures at 11.75 cents. On March 23 spot carload lots were quoted at 12 cents, New York, duty paid.

COPPER. During the last part of March there was a decided improvement in export sales of copper and a better demand from domestic users. According to statistics recently prepared by the Copper Exports Association, the United States alone produces 54 per cent of the world's output of copper and consumes 49 per cent of the total. Europe, the United States' best customer for this metal, produces 8 per cent and consumes 44 per cent. While consumption of copper in the United States has more than doubled since 1914, the European market is only about 25 per cent higher than in that year.

LEAD. On two successive days, March 2 and 3, the American Smelting & Refining Co. advanced its New York contract price from 7.40 cents to 7.55 cents, and then to 7.65 cents, New York, at which figure it has since remained. In the outside market the price has been 7.40 cents, St. Louis, until recently when the quotation was 7.30 cents.

STEEL. Orders for steel continue to gain, according to *The Iron Age*, although there is no expansion of automobile manufacture or special building or railroad activity. A large part of this steel production is going directly into consumption, while the impending bituminous coal strike is apparently not as much dreaded as it has been.

TIN. Prices remain around the 70-cent level, and much of the trading in recent weeks has been among dealers only.

ZINC. The zinc market is showing some improvement and prices are apparently tending higher. On March 22 the minimum price was 6.67½ cents a pound, East St. Louis.

Basic Metals

March 24, 1927

	Cents per pound	
Aluminum, virgin, 98@99 per cent	26.00	@
Antimony	12.75	@13.00
Copper—Lake, spot	13.375	@13.50
Electrolytic, spot	13.25	@13.375
Castings, refinery	12.75	@
Lead, spot, New York	7.55	@ 7.60
Lead, spot, East St. Louis	7.25	@ 7.30
Nickel, ingot, pound	35.00	@
Tin, spot	68.75	@
Zinc, spot, New York	7.00	@ 7.025
Zinc, spot, East St. Louis	6.65	@ 6.675

Steel Wire

	Base per 100 lbs.	
Bright, plain wire No. 9 gage	$2.40	@
Annealed fence wire	2.55	@
Galvanized wire No. 9	3.00	@
Spring wire	3.40	@

Copper Wire

BASE PRICE F. O. B. FACTORY

	Cents per pound	
Bare copper wire	15.375	@
No. 6, B. & S. gage	15.375	@
No. 8, B. & S. gage	15.375	@
No. 14, B. & S.	16.375	@

UNITED STATES EXPORTS TO THE UNITED KINGDOM OF TIRES AND tubes totaled for 1926 $3,230,202, as compared with $2,970,680 for 1925, $2,970,688 for 1924, and $3,765,842 for 1923.

Compounding Ingredients Market

MARCH business was very heavy in all compounding ingredients because in that month capacity tire and tube schedules are in full effect. It is estimated that those lines consume as much tonnage of compounding ingredients as is used in all the other manufacturing divisions of the rubber industry combined. Prices for practically all ingredients are firm. In some instances they are keenly competitive, notably so with cheap fillers. A case in point is a certain domestic whiting selling at $4 a ton, car load lots, in burlap bags. If the bags are returned with the second car load order the price becomes $3 a ton.

ACCELERATORS. The various types of accelerators are selling freely and the demand is gaining steadily in volume. This is true even of ultra-accelerators. One of the widely known semi-ultra accelerators has gained so rapidly in favor the past year as to allow a reduction of 17 per cent in its price due to the volume of its sales. The semi-ultra accelerator cures satisfactorily at the heat of 20 pounds of steam and when properly selected admits increasing the reclaim in a compound without deterioration of quality.

ANTI-OXIDANTS. The tendency to displace rubber with reclaim wherever possible is rendered safe by preserving the goods against deterioration by the addition of an anti-oxidant. These act as favorably when they are compounded with reclaims as with new rubber.

BENZOL. This material continued throughout the month in fairly active demand with stocks in ample supply. Early in March the price was reduced one cent a gallon, due to competition.

CARBON BLACK. Early in the month there was increased demand for carbon black against contracts. Throughout the month there was an increasing improvement in business.

LITHARGE. The last week of February, business was mostly in small lots and interest was merely routine. In March prices remained unchanged and demand was only fairly active.

LITHOPONE. Six months' output is now contracted ahead. There is a heavy movement against contracts. Producers are busy and prices remain unchanged.

MINERAL RUBBER. This material is relatively in as strong a technical position in the rubber industry as reclaim or even crude rubber itself. It is moving in good volume at competitive prices.

SOLVENT NAPHTHA. Stocks are liberal. Prices hold firm and unchanged. There is a steady movement in response to good consuming demand.

ZINC OXIDE. There is a steady price undertone. Shipments on contracts are active and necessitating steady production.

New York Quotations

March 26, 1927

Accelerators, Inorganic

Lead, carbonate	lb.	$0.09¾	@
Lead, red	lb.	.10¾	@
sublimed white	lb.	.09	@
sublimed blue	lb.	.09	@
super-sublimed white lead	lb.	.09½	@
Lime, R. M. hydrated	ton	15.00	@25.00
Litharge	lb.	.10¼	@
Magnesia cal., light (bbls.)	lb.	.15	@
calcined, extra light (bbls.)	lb.		@
calcined, heavy (bbls.)	lb.	.04	@ .04¼
magnesium, carb., light		.08¾	@
Orange mineral A.A.A	lb.	.13	@
Rubber lead No. 4	lb.		@

Accelerators, Organic

Aldehyde ammonia	lb.	.80	@ .85
Crylene, hard form	lb.	.70	@
Paste	lb.	.50	@
Di-ortho-tolylguanidine	lb.	.90	@
Diphenyl guanidine	lb.	.72	@
Ethylidine aniline	lb.		@
Formaldehyde aniline	lb.		@
Grasselerator 102	lb.	.80	@ .82½
552	lb.	4.80	@ 5.00
808	lb.	1.15	@ 1.35
Heptene	lb.	.55	@
Hexamethylene tetramine	lb.	.80	@ .85
Hydrofuramide	lb.		@
Lithex	lb.	.18	@ .20
Methylene aniline	lb.		@
Methylene dianiline	lb.	.40	@
Monex	lb.	3.25	@
No. 999 lead oleate	lb.	.16½	@
Phenyl orthotolyl guanidine	lb.	.76½	@ .81
Piperidine penta-dithio-carb.	lb.	4.80	@ 5.50
R. & H. 50 (100 lb. drums)		.60	@ .68
Tensilac No. 39	lb.	.55	@ .60
No. 41	lb.	.65	@ .68
Thionex	lb.	3.25	@
Thiocarbanilid	lb.	.22	@ .30
Trimene	lb.	.75	@
base	lb.	1.20	@
Triphenylguanidine	lb.	.69	@
Vulcanex	lb.	.86	@
Vulcanol	lb.	1.08	@
Vulcone	lb.	.70	@
W-29	lb.	1.65	@
W-87	lb.		@

Acids

Acetic 28% (bbls.)	100 lbs.	3.63	@
glacial (carboys)	100 lbs.	12.66	@
Oleic	lb.	.09½	@ .09¾
Stearic	lb.	.14	@ .14½
Sulphuric, 66%	100 lbs.	1.60	@

Alkalies

Caustic soda, solid	100 lb.	$2.25	@
Sulphite soda	100 lbs.	3.50	@

Anti-Oxidants

Antox	lb.	.83	@
V. G. B	lb.	.55	@ .66

Colors

BLACK

Bone	lb.	.05	@ .21
Carbon (see Comp. Ing.)			
A. & W. nonfli No. 1	lb.	.40	@
No. 2	lb.	.25	@
Drop	lb.	.07	@ .20
Lampblack (commercial)	lb.	.10	@ .40

BLUE

A. & W. blue	lb.	1.25	@ 5.00
Du Pont, N	100 lbs.	1.35	@
Marine, A. C	100 lbs.	1.30	@
5 R	100 lbs.	1.00	@
2 G	100 lbs.	.90	@
Prussian	lb.	.33	@ .35
Ultramarine	lb.	.09	@ .25

BROWN

Sienna, Italian	lb.	.05	@
Umber, Turkey	lb.	.04½	@ .06

GREEN

A. & W. green	lb.	1.25	@ 3.00
Chrome, light	lb.	.27	@
medium	lb.	.29	@
dark	lb.	.31	@
Du Pont, A. C	100 lbs.	3.00	@
4 G	100 lbs.	.60	@
G. L.	100 lbs.	.30	@
Y. L.	100 lbs.	.75	@
Oxide of chromium	lb.	.38	@

ORANGE

Du Pont, 2 R	100 lbs.	1.40	@
R. X.	100 lbs.	1.30	@
Y. O.	100 lbs.	1.60	@

RED

A. & W. red	lb.	.75	@ 3.50
purple	lb.	2.00	@ 4.00
Antimony, golden, No. 40	lb.	.22	@ .25
No. 60	lb.	.16	@ .20
golden 15/17%	lb.	.20	@
T. K. "Special" 1%	lb.	.38	@
Pentasulphide 15/17%	lb.	.18	@

Colors—*(Continued)*

Antimony,			
Crimson, R.M.P. No. 3	lb.	$0.48	@
Sulphur free	lb.	.52	@
T. K. 15/17%	lb.	.40	@
Sulphur free	lb.	.50	@
7-A	lb	.35	@
Z-2	lb	.20	@
Vermilion, No. 5	lb.	.50	@ .55
No. 15	lb.	.37½	@ .42
Du Pont R. I.	100 lbs.	2.00	@
6 B	100 lbs.	1.10	@
4 B L	100 lbs.	.60	@
Brilliant A. C.	100 lbs.	1.05	@
Iron Oxides			
bright pure domestic	lb.	.12	@
bright pure English	lb.	.14	@
bright reduced English	lb.	.10½	@
bright reduced domestic	lb.	.10	@
Indian (maroon), pure domestic	lb.	.11	@
Indian (maroon), pure English	lb.	.10½	@ .11½
Indian (maroon), reduced English	lb.	.09½	@ .10½
Indian (maroon), reduced domestic	lb.	.08	@
Oximony	lb.	.13¼	@
Spanish red oxide	lb.	.04	@
Venetian reds	lb.	.02	@ .06
Vermilion, English quicksilver	lb.	1.65	@

WHITE

Lithopone	lb.	.05½	@
Azolith	lb.	.05¼	@ .05¾
Grasselli	lb.	.05¾	@ .05¾
Sterling	lb.	.05⅜	@ .06⅛
Zinc Oxide			
AAA (lead free)	lb.	.07¼	@ .07⅜
Azo (factory):			
ZZZ (lead free)	lb.	.06½	@ .07
ZZ (leaded)	lb.	.06⅝	@ .07⅛
Z (8% leaded)	lb	.06⅝	@ .07⅛
French Process			
Green seal	lb.	.10⅞	@
Red seal	lb.	.09⅞	@
White seal	lb.	.11⅞	@

YELLOW

A. & W. yellow	lb.	2.00	@ 4.00
T. K. Sulphide	lb.	.65	@
Cadmium sulphide	lb.	1.50	@
Chrome	lb.	.17	@ .18
Du Pont N	100 lbs.	4.00	@
R. R	100 lbs.	1.55	@
Grasselli cadmium	lb.	1.50	@
Ochre, domestic	lb.	.01½	@ .02
imported	lb.	.04	@ .04½
Oxide, pure	lb.	.11	@
Zinc imp	lb.	.24	@

New York Quotations

March 26, 1927

Compounding Ingredients

Aluminum flake (sacks e.l.)	*ton*	$21.85	@
(sacks l.c.l.)	*ton*	24.50	@
Silicate	*ton*	18.00	@24.00
Ammonium carbonate powd.	*lb.*	.10½	@
lump	*lb.*	.10½	@
Asbestine	*ton*	13.50	@14.50
Barium, carbonate	*ton*	52.00	@
dust	*lb.*	.05	@ .06
sulphate	*lb.*	.04	@
Barytes, imported	*ton*	27.00	@36.00
water ground and floated	*ton*	23.00	@25.00
Basofor	*lb.*	.04½	@
Blanc fixe, dry	*ton*	85.00	@90.00
pulp	*ton*	60.00	@63.00
Carbon Black			
Aerfloted grrow	*lb.*	.09	@ .13
Compressed	*lb.*	.07½	@ .11½
Uncompressed	*lb.*	.07	@ .11
Micronex	*lb.*	.08	@ .12
Carrara filler	*ton*	26.00	@
Chalk	*ton*	18.00	@20.00
Clay china	*lb.*	.01½	@
Langford	*ton*	12.00	@
Mineral flour (Florida)	*ton*	20.00	@23.00
Perfection	*ton*	16.00	@27.00
Suprex	*ton*	13.00	@26.00
Cotton flock, black	*lb.*	.10½	@ .12½
light-colored	*lb.*	.11	@ .12
white	*lb.*	.12½	@ .26
Fossil flour	*lb.*	.02½	@
Glue, high grade	*lb.*	.17	@ .24
low grade	*lb.*	.17	@ .20
Infusorial earth	*lb.*	.02½	@
Mica, amber (fact'y)	*lb.*	.05	@
Pumice stone, powd.	*lb.*	.02½	@ .04
Rotten stone (bbls.)	*lb.*	.02½	@ .04½
Soap bark	*lb.*	.12½	@ .13
Soapstone	*ton*	15.00	@22.00
Sodium bicarb	*100 lbs.*	2.00	@
Stearex	*lb.*	.10	@ .14
Talc, domestic	*lb.*	.01¾	@ .02
French	*ton*	18.00	@22.00
Velvetex	*lb.*	.04	@ .07

Compounding Ingredients—*(Continued)*

Whiting:			
Commercial	*100 lbs.*	$0.85	@$1.00
English, cliffstone	*100 lbs.*	1.50	@
Snow white	*ton*	12.00	@23.00
Westminster Brand	*100 lbs.*		@
Witco (e.l.) (fact'y)	*ton*	12.00	@20.00
Whiting, imp. chalk	*100 lbs.*	1.00	@ 1.25
Paris White, Eng. Cliff	*100 lbs.*	1.50	@ 2.50
Wood flour	*ton*	40.00	@

Mineral Rubber

Genasco (facty.)	*ton*	50.00	@52.00
Gilsonite (fact'y)	*ton*	37.14	@39.65
Hydrocarbon, soft	*ton*	28.00	@34.00
Ohmlac Kapack, M. R.	*ton*	60.00	@
M-4	*ton*	175.00	@
Paracura (fact'y)	*ton*	62.50	@65.00
Pioneer, M. R., solid (fac.)	*ton*	41.00	@43.00
M. R. granulated	*ton*	51.00	@53.00
Robertson, M. R. solid (facty.)	*ton*	34.00	@80.00
M. R. gran. (facty.)	*ton*	34.00	@80.00

Oils (Softeners)

Castor, No. 1, U. S. P.	*lb.*	.14½	@
No. 3, U. S. P.	*lb.*	.14	@
Corn, crude (bbls.)	*lb.*	.10	@
Cotton	*lb.*	.09	@ .10
Fluxrite fluid	*lb.*	.05	@ .06
solid	*lb.*	.05	@ .06
Glycerine	*lb.*	.27	@ .28
Linseed, raw	*lb.*	.11	@
Palm lagos (bbls.)	*lb.*	.10¼	@
niger (bbls.)	*lb.*	.10	@
Peanut, crude	*lb.*	.11	@
refined	*lb.*	.15	@
Petrolatum, standard	*lb.*	.06	@ .08
sticky	*lb.*	.08	@ .10
Pine, steam distilled	*gal.*	.70	@ .72
Plastone	*lb*	.39	@
Rapeseed, refined	*lb.*	.11	@
Rosin	*gal.*	.70	@

Resins and Pitches

Pitch	*bbl.*	9.00	@10.00
Pine tar, retort	*bbl.*	16.00	@16.50
Ponto	*lb.*		@
Rosin, K (bbl.)	*280 lbs.*	14.55	@
Shellac, fine orange	*lb.*	.70	@
Tar, kiln	*bbl.*	15.50	@16.00

Solvents

Benzol (90%, 7.21 lbs. gal.) pure	*gal.*	$0.29	@
Carbon bisulphide (10.81 lbs. gal.) 99.9% pure (drums)	*lb.*	.05½	@ .06¼
tetrachloride (13.28 lbs. gal.) 99.7% pure (drums)	*lb.*	.06¾	@
Gasoline			
No. 303			
Tankcars	*gal.*	.16½	@
Drums, c. l.	*gal.*	.22½	@
Drums, l. c. l.	*gal.*	.24½	@
Turpentine, spirits	*gal.*	.71	@ .72
wood, steam distilled	*gal.*	.67	@ .68

Substitutes

Black	*lb.*	.08	@ .14
Brown	*lb.*	.09	@ .15
White	*lb.*	.09	@ .17

Vulcanizing Ingredients

Sulphur			
Velvet flour	*100 lbs.*	2.60	@ 3.50
Soft rubber (e.l.)	*100 lbs.*	2.60	@ 2.95
(l.c.l.)	*100 lbs.*	2.95	@ 3.30
Superfine commercial flour (e.l.)	*lb.*	2.20	@ 2.90
(l.c.l.)	*lb.*	2.80	@ 3.10
Tire brand, superfine	*100 lbs.*	2.20	@ 2.55
Tube brand, velvet	*100 lbs.*	2.60	@ 2.95
(See also Colors—Antimony)			

Waxes

Wax, beeswax, white, com.	*lb.*	.55	@
carnauba	*lb.*	.38	@ .50
ceresine white	*lb.*	.13	@
montan	*lb.*	.07	@ .07½
ozokerite, black	*lb.*	.30	@
green	*lb.*	.32	@
Paraffin			
122/124 white crude scale	*lb.*	.04	@
124/126 white crude scale	*lb.*	.04¼	@
123/125 fully refined	*lb.*	.05¼	@ .05¼
125/127 fully refined	*lb.*	.05½	@

EXPORTS OF COMPOUNDING INGREDIENTS

Although American exports of pigments, colors, and various rubber compounding ingredients showed in 1925 an advance of 60 per cent as compared with 1922, the records for these shipments in 1926, according to *Commerce Reports*, indicated little change in volume, while the total values were only two per cent greater than the 1925 figures. The largest totals were represented in the estimates for the zinc oxide and lithopone exports, these being respectively 29,322,600 pounds, value $1,917,400; and 3,881,300 pounds, value $200,400. Foreign sales of bone black and lamp black amounted to 3,528,700 pounds, value $241,600; while carbon black shipments represented higher values but lower quantities: 39,210,400 pounds, value $3,621,900.

EXPOSITION OF CHEMICAL INDUSTRIES

The Chemical Industries Exposition will be held in the Grand Central Palace, New York, N. Y., from September 26 to October 1, 1927, and both American and foreign manufacturers of chemicals are showing much interest in the plans for this event. Much of the space in the Grand Central Palace has already been sold.

RED DIAMOND RECLAIM

A recent noteworthy achievement in rubber reclaiming has been reached in the production of the high tensile red reclaim, known as Red Diamond. This product possesses the following physical characteristics: Specific gravity 1.20; rubber content 60 per cent, with very low acetone extract; tensile strength at rupture 1,500 pounds per square inch; and elongation at break 550 per cent.

It has particular interest to compounders because of its value in the manufacture of red inner tubes and red mechanicals, not only for its high-tensile properties, but especially because it retains color during cure without assistance by the addition of red pigment.

ANNUAL MEETING OF N. A. W. M. D.

The fourteenth annual meeting of the National Association of Waste Material Dealers, was held March 16 at the Hotel Astor, New York, N. Y., there being an unusual number of members present. On this occasion the following officers were elected: G. H. Rady, president; Henry Lissberger, first vice president; James Rosenberg, second vice president; Henry Levitt, third vice president; Charles M. Haskins, secretary-treasurer.

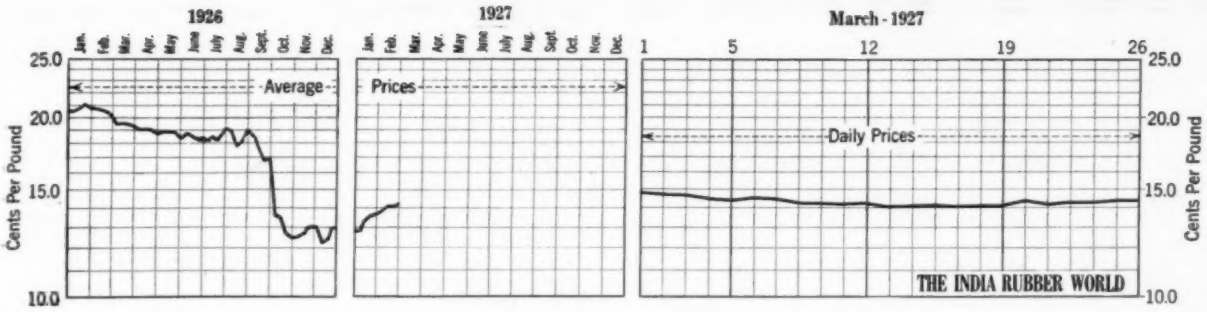
There was a meeting of the Scrap Rubber Division on Tuesday, March 15, at 11 A. M., the meeting being called to order by E. B. Friedlander, chairman of the division.

The policy of furnishing mill reports to shippers was discussed and it was suggested that a recommendation be made that the classification in connection with mill reports provide that where there is no discrepancy the mill report should be submitted to the National Association of Waste Material Dealers, Inc., who would verify the figures and furnish a verification to the shipper.

The division also appointed a committee to provide a specification for mixed inner tubes, which is not covered in the existing classifications. The committee appointed consisted of Nat E. Berzen, J. Muehlstein and David Feinburg. The committee later reported the following provision: "Mixed inner tubes to consist of average accumulation of live auto inner tubes, with or without metal valves to be free of crusty, puncture-proof tubes, filled and cloth tubes."

David Feinburg was elected as chairman of the division for the coming year.

The association's annual banquet was also held at the Hotel Astor, on the evening of March 16. Egmont L. Frankel, president of the organization, was toastmaster, while the chief address of the evening was made by Hon. M. M. Neely, U. S. Senator, this being followed by some brief and humorous remarks by Edward Ford. Mildred Enright, soloist, and William Caesar's orchestra furnished music for the occasion.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

Market for Cotton and Fabrics

AMERICAN COTTON. The market for spot middling cotton March 1 was 14.85 cents, the highest so far this year. From that level it declined steadily to 14 cents on March 14 and held substantially at that point for the following week and in the succeeding week reacted strongly upward, reaching 14.4 on March 26. This advance in prices will check interest in reduction of acreage, but will probably not be further sustained. It is expected that the market will move in accordance with the development of the factors of weather, acreage and the use of fertilizers as influencing new crop prospects. The latest ginning report sets the last crop at 17,910,000 bales. Reduction of acreage for the next crop will probably not exceed 15 per cent.

EGYPTIAN. Extra staples as a whole seem to be firmer, without important price changes. Previous to the government ginning report, issued November 21, Egyptian and American staples had shown a decided tendency to sag, but after the report they firmed up and have not yet come down much in sympathy with the recent easing of American short staple prices. On the other hand, stocks of staple cottons everywhere are undeniably large, therefore it would seem likely that any movement which may occur will be downward.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. There has been practically no change during the past month, except the general strengthening in the fabric market conditions. Caution on the part of buyers is lessening and recognition of present basically favorable values is asserting itself in freer engagement of merchandise for forward delivery. The outstanding factor of the cotton and goods markets is the continued huge exports of American cotton. This keeps the domestic market in a position requiring close watching on the part of those needing summer supplies either of the staples or the fabrics.

HOLLANDS. There is a new type of hollands known as rubber trade special R.T.3A. It comes in widths of 31, 40, and 50 inches.

RAINCOAT FABRICS. The raincoat trade is very quiet due to the present being a between seasons period. Rubberizers are sampling their lines preliminary to deciding upon their fabrics.

SHEETING. The market for sheetings is very active and strong. The demand is inclining toward the better grades because of the low price of cotton. The mills are well supplied with orders for the next two months, which holds prices firm.

TIRE FABRICS. Market prices have held firm the past month, with a distinct tendency to advance in sympathy with the staple market. In general, the consumption of tire fabrics is at the peak rate, because tire plants have scheduled their production above normal capacity. The usual demand is for tire cord of 13 pounds breaking strength for 25/5/3 construction. Fabric mills have withdrawn all low quotations and have orders covering operation to July or longer.

New York Quotations

March 26, 1927

Drills

38-inch 2.00-yard	*yard*	$0.15¼@
40-inch 3.47-yard		.09½@
52-inch 1.90-yard		.16⅜@
60-inch 1.52-yard		.20¾@

Ducks

38-inch 2.00-yard	*yard*	.16 @
40-inch 1.47-yard		.21½@
72-inch 16.66-ounce		.36¾@
72-inch 17.21-ounce		.37½@
MECHANICAL		
Hose and belting	*pound*	.29½@
Specials		.33½@
TENNIS		
52-inch 1.35-yard	*yard*	.23¾@

Hollands

RUBBER TRADE SPECIAL		
R. T. 3 A.		
31-inch	*yard*	.20 @
40-inch	*yard*	.25 @
50-inch	*yard*	.45 @
RED SEAL		
36-inch		.14½@
40-inch		.15 @
50-inch		.22½@
GOLD SEAL		
40-inch, No. 72		.19 @
40-inch, No. 80		.20½@

Osnaburgs

40-inch 2.35-yard	*yard*	$0.13½@
40-inch 2.48-yard		.12⅝@
40-inch 3.00-yard		.10⅜@
37-inch 2.42-yard		.13⅛@

Raincoat Fabrics

COTTON		
Bombazine 60 x 64	*yard*	.11 @
Bombazine 60 x 48		.10 @
Plaids 60 x 48		.11¼@
Plaids 48 x 48		.10½@
Surface prints 60 x 48		.11¾@
Surface prints 64 x 60		.12¾ @

Sheetings, 40-inch

48 x 48, 2.50-yard	*yard*	.11 @ .11⅛
48 x 48, 2.85-yard		.10½@
64 x 68, 3.15 yard		.10¾@
56 x 60, 3.60-yard		.09¼@
48 x 44, 3.75-yard		.08 @

Sheetings, 36-inch

48 x 48, 5.00-yard	*yard*	.06¼@ .06⅜
44 x 40, 6.15-yard		.05¾@

Tire Fabrics

SQUARE WOVEN 17¼-ounce		
Egyptian, karded	*pound*	$0.45 @
Peeler, karded		.38 @
CORD 23/5/3		
Egyptian, combed	*pound*	.50 @
Egyptian, karded		.45 @
Peeler karded, 1 1/16-in.		.38 @
CORD 23/4/3		
Peeler, karded	*pound*	.39 @
CORD 23/3/3		
Peeler, karded	*pound*	.46 @
CORD 15/3/3		
Peeler, karded	*pound*	.35½@
CORD 13/3/3		
Peeler, karded	*pound*	.35 @
LENO BREAKER		
Peeler, karded	*pound*	.36½@
10-oz. Peeler, karded		.36½@
CHAFER		
8.25-oz. Peeler, karded (2 ply)	*pound*	@
9.5-oz. Peeler, karded (4-ply)		@
12-oz. Peeler, karded		.40 @
14-oz. Peeler, karded		.37 @

The Cotton Outlook

Final Report on 1926 Cotton Crop

THE Census Bureau, in issuing on March 21 its final ginning report for 1926 in connection with the United States cotton crop, estimates the total production at 17,910,258 500-pound bales, exclusive of linters. This amount is approximately 708,000 bales below the final estimate of the Department of Agriculture, which placed the 1926 crop at 18,618,000 bales. In commenting on these Census figures, *The New York Times* says editorially in part:

Even a cotton crop of 17,910,000 bales would exceed by 1,800,000 the largest previous harvest; but meantime the fall in prices, due to belief in a still larger yield, has produced some remarkable results. In the preceding cotton season, home spinners and foreign markets had taken 216,000 bales more of our cotton than in the preceding twelvemonth. But in the past seven months the similar takings have run nearly 2,000,000 bales beyond the previous season's total; a rate of increase which, if continued up to the season's end, would raise the consumption from the crop of 1926 something like 3,300,000 bales above that of the crop of 1925. In other words, huge as last year's cotton production admittedly has been, consumption has much more than kept pace with it. That would not be the first occasion on which prediction of "ruin of the South" through a bumper cotton yield has been confuted by visible evidence that the textile trade would take the surplus product, if fair inducement was offered in the price.

The Question of Cotton Acreage Reduction

Less and less seems to be heard regarding cotton acreage reduction in 1927, especially as in recent months both domestic consumption and exports to foreign countries have been so surprisingly large. For the seven months ended February 28, 1927, the Census Bureau estimates a consumption by domestic cotton mills of 4,024,487 bales, as against 3,745,552 bales in the corresponding period of last year. Exports have also been 7,699,519 bales, as compared with 5,986,630 for the seven months' period of a year ago.

As to cotton acreage reduction, prospects for any decided change seem remote. The individual farmer, according to those who have traveled recently in the southern states, believes that a cut is in order, but is apparently determined to plant the usual acreage, trusting to his neighbors to do the reducing.

Conference Regarding Universal Cotton Standards

Delegates appointed from all the leading countries of Europe have been attending in Washington, D. C., the biennial conference for the consideration and adoption of universal standards for American cotton (American upland), the sessions taking place at the Bureau of Agricultural Economics. On the evening of March 22 the New York Cotton Exchange gave a reception and dinner at the Ritz-Carlton in honor of the European delegates, S. T. Hubbard, Jr., president of the Exchange, presiding as toastmaster. Many of the delegates also attended the annual convention of the Texas Cotton Association, which was held March 25 and 26 at Dallas, Texas.

World's Record Cotton Consumption

World mill consumption of cotton during the six months ended January 31, 1927, exceeded that of any corresponding period on record, according to cabled information received by the Department of Agriculture from the Federation of Master Cotton Spinners' Association, Manchester, England. During this period the quantity consumed was placed at 12,934,000 running bales, an increase of about 5 per cent over the corresponding period a year ago and a gain of approximately 5 per cent over the preceding six months of 1926. A little more than half of the cotton consumed during the six months reported upon was American cotton.

Regarding the outlook for the American industry the *Journal of Commerce* says:

Meantime the foreign demand continues, though new business may not be so large as at one time. There will be a big export movement in the near future to India, China, Japan and Russia. It is no news to say that the excess of exports over those up to this time last year bids fair to continue and increase. The total may establish a new peak in this branch of cotton history. The world was caught napping by the sudden revival of the cotton business all over the globe; the spinners, not to put too fine a point on it, had been playing the role of the foolish oil buyers of fable. Their buying in the last half of the cotton year promises amply to atone for their remissness in the first half, beguiled by the hopes of very much lower prices at once. The American crop may show an increase for the season of nearly or quite 2,000,000 bales, but the decrease in foreign crops approximated 1,350,000 bales, so that the net gain in the world's crop was really only 650,000 bales. Some close students of the cotton trade think it will be less.

Moreover, the world's consumption, stimulated by American cheapness and foreign crop deficiencies, may turn out to be anywhere from 1,000,000 to 1,500,000 bales larger than even the high record of last year. That is considered easily conceivable, although the season has nearly five months to run, and there may be some decrease in the absorption by the world later. The total for the season is now up to 7,947,536 bales, or 1,774,216 bales larger than that at this time last year.

British Cotton Speculators Make Big "Cleanup"

The American cotton surplus, although deplored in the United States, is apparently welcomed in foreign countries, judging from the increasing American shipments. It is said that recently certain shrewd British speculators have taken advantage of the overproduction of cotton in the United States and have bought large stocks at the lowest price. The story goes that this group of English spinners and speculators waited until the price had hit the bottom, and then as quietly as possible bought in unprecedented quantities. It is said that they have purchased enough cotton to keep British mills busy for two or more seasons, and have incidentally cleaned up about $50,000,000.

Foreign Cotton Production Decreases

A decline of some 13 per cent in the cotton production of foreign countries is reported by the United States Department of Agriculture, while in the three largest foreign cotton producing countries, India, Egypt, and China, there has been a decrease from last year's total of 18 per cent. There have been slight increases however in the Anglo-Egyptian Sudan, Chosen, Turkey, and particularly in Mexico, while Brazil is already making plans for the further development of its cotton growing industry. It is said that Russia is also intending to plant 1,810,000 acres to cotton, or an increase of 27.6 per cent over the previous season.

The following dealers in cotton goods for the rubber industry are listed in our Buyers' Directory. For complete information see Index to Advertisers on Page 106.

Adams, H. J. Co., The, Akron, Ohio.
Bibb Manufacturing Co., Macon, Georgia.
Brighton Mills, Passaic, New Jersey.
Callaway Mills, Inc., New York, N. Y.
Cannon Mills, Inc., New York, N. Y.
Curran & Barry, New York, N. Y.
Lane, J. H. & Co., New York, N. Y., and Chicago, Illinois.
Lawrence & Co., New York, N. Y.
Willingham Cotton Mills, Macon, Georgia.

United Kingdom Rubber Statistics

Imports

UNMANUFACTURED	Month Ended January, 1926		Month Ended January, 1927	
Crude rubber				
From—	Pounds	Value	Pounds	Value
Straits Settlements	11,574,300	£2,097,836	13,117,800	£1,070,748
Federated Malay States	3,765,100	666,524	4,933,800	408,436
British India	1,271,700	230,737	1,150,700	95,084
Ceylon and Dependencies	3,589,800	654,634	4,768,100	383,584
Other Dutch possessions in Indian Seas	1,079,000	185,764	2,036,200	174,042
Dutch East Indies (except other Dutch possessions in Indian Seas)	2,044,300	356,043	2,845,100	234,194
Other countries in East Indies and Pacific, not elsewhere specified	176,200	28,520	220,300	18,252
Brazil	1,046,300	189,993	1,187,300	73,927
Peru	.....	.....	.....	.....
South and Central America (except Brazil and Peru)	3,600	555	31,500	2,305
West Africa:				
French West Africa	567,600	71,996	39,500	2,180
Gold Coast	53,900	6,523	41,300	3,209
Other parts of West Africa	271,200	35,896	164,700	12,895
East Africa, including Madagascar	129,300	18,370	169,300	13,224
Other countries	205,600	36,314	54,500	4,413
Totals	25,777,900	£4,579,705	30,760,100	£2,496,493
Waste and reclaimed rubber	1,012,800	£17,975	549,300	£12,094
Gutta percha and balata	789,400	122,155	871,000	85,407
Rubber substitutes	13,500	487	39,300	1,476
Totals	1,815,700	£140,617	1,459,600	£98,977
MANUFACTURED				
Boots and shoes....*doz. pairs*	34,415	£70,290	31,335	£63,554
Tires and tubes				
Pneumatic				
Outer covers	.....	291,293	.....	349,848
Inner tubes	.....	36,072	.....	30,093
Solid tires	.....	25,866	.....	27,744
Other rubber manufactures	.....	143,596	.....	142,464
Totals	.....	£567,117	.....	£613,703

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	2,860,400	£41,768	1,957,300	£21,741
Rubber substitutes	178,400	3,667	81,000	1,886
Totals	3,038,800	£45,435	2,038,300	£23,627
MANUFACTURED				
Boots and shoes....*doz. pairs*	16,454	£27,242	13,933	£23,024
Tires and tubes				
Pneumatic				
Outer covers	.....	242,250	.....	292,176
Inner tubes	.....	54,894	.....	56,886
Solid tires	.....	42,025	.....	39,125
Other rubber manufactures	.....	227,289	.....	225,674
Totals	.....	£593,700	.....	£636,885

Exports—Colonial and Foreign

UNMANUFACTURED	Month Ended January, 1926		Month Ended January, 1927	
Crude Rubber				
To—	Pounds	Value	Pounds	Value
Russia	743,300	£132,860	1,799,400	£258,319
Sweden, Norway and Denmark	72,500	12,686	174,200	18,527
Germany	957,200	176,250	1,469,300	122,879
Belgium	126,400	23,350	272,500	21,951
France	1,814,400	361,125	2,370,100	190,271
Spain	70,200	12,512	129,500	11,233
Italy	953,200	195,279	604,300	47,337
Other European countries	94,000	19,170	269,800	24,011
United States	5,437,500	1,062,102	767,400	62,819
Canada	27,000	4,836	1,200	186
Other countries	58,200	11,572	73,300	7,479
Totals	10,353,900	£2,011,742	7,931,000	£765,012
Waste and reclaimed rubber	14,600	£418	62,700	£1,282
Gutta percha and balata	33,400	5,144	17,600	1,579
Rubber substitutes	.....	.....	.....	.....
Totals	48,000	£5,562	80,300	£2,861
MANUFACTURED				
Boots and shoes....*doz. pairs*	399	£1,946	1,686	£3,342
Tires and tubes				
Pneumatic				
Outer covers	.....	29,982	.....	78,793
Inner tubes	.....	4,578	.....	11,638
Solid tires	.....	1,316	.....	1,422
Other rubber manufactures	.....	5,128	.....	7,563
Totals	.....	£42,950	.....	£102,758

Dominion of Canada Rubber Statistics

Imports of Crude and Manufactured Rubber

UNMANUFACTURED	December, 1926 Pounds	December, 1926 Value	Nine Months Ended December, 1926 Pounds	Nine Months Ended December, 1926 Value
Rubber, gutta percha, etc.				
From United Kingdom	3,344	$1,382	64,189	$23,763
United States	3,934,278	1,643,483	28,930,035	13,587,359
Straits Settlements	182,985	72,696	2,333,164	999,173
Dutch East Indies	11,107	4,599	255,367	126,759
France	2,587	492	2,587	492
Other countries	.....	.....	11,200	15,600
Totals	4,134,301	$1,722,652	31,596,542	$14,753,146
Rubber recovered	663,964	$83,191	5,713,472	$684,562
Rubber, powdered and rubber or gutta percha scrap	532,447	43,779	5,346,255	312,587
Balata	.....	.....	6,000	3,968
Rubber Substitutes	62,469	4,508	590,581	66,563
Totals	1,258,880	$131,478	11,656,308	$1,067,680
PARTLY MANUFACTURED				
Hard rubber sheets and rods	3,204	$2,467	81,521	$47,463
Hard rubber tubes	.....	1,779	.....	8,696
Rubber thread not covered	17,172	23,746	107,057	166,477
Totals	20,376	$27,992	188,578	$222,636
MANUFACTURED				
Belting	.....	$16,408	.....	$173,530
Hose	.....	14,903	.....	133,500
Packing	.....	3,542	.....	35,730
Boots and shoes.....*pairs*	7,736	14,776	55,004	93,030
Clothing, including waterproofed	.....	17,635	.....	177,080
Gloves	.....	350	.....	14,578
Hot water bottles	.....	1,592	.....	14,714
Tires, solid.....*number*	45	1,958	530	29,322
Tires, pneumatic.....*number*	608	13,687	32,584	236,806
Tires, tubes.....*number*	802	2,208	12,682	32,627
Elastic, round and flat	.....	16,759	.....	142,706
Mats and matting	.....	2,104	.....	35,442
Cement	.....	3,331	.....	72,080
Golf balls .....*dozen*	152	502	34,476	140,435
Heels, rubber .....*pairs*	35,132	2,037	197,993	11,830
Other rubber manufactures	.....	80,187	.....	962,061
Totals	.....	$191,979	.....	$2,305,471
Totals, rubber imports	.....	$2,074,101	.....	$18,348,933

Exports of Domestic and Foreign Rubber Goods

UNMANUFACTURED	December, 1926 Produce of Canada Value	December, 1926 Re-exports of Foreign Goods Value	Nine Months Ended December, 1926 Produce of Canada Value	Nine Months Ended December, 1926 Re-exports of Foreign Goods Value
Crude and waste rubber	$20,419	.....	$225,590	.....
Totals	$20,419	.....	$225,590	.....
MANUFACTURED				
Belting	$40,881	.....	$435,329	.....
Canvas shoes with rubber soles	224,914	.....	2,950,386	.....
Boots and shoes	156,299	.....	2,135,998	.....
Clothing, including waterproofed	1,713	.....	19,602	.....
Hose	27,357	.....	213,345	.....
Tires, casings	1,375,319	.....	10,598,615	.....
Inner tubes	238,787	.....	1,808,943	.....
Solid	39,108	.....	216,381	.....
Other rubber manufactures	60,323	$2,739	453,806	$92,909
Totals	$2,164,701	$2,739	$18,832,405	$92,909
Totals, rubber exports	$2,185,120	$2,739	$19,057,995	$92,909

Landings, Deliveries and Stocks in London and Liverpool as Returned by the Warehouses and Wharves During the Month of January, 1927

	Landed for January	Delivered for January	Stocks, January 31st		
LONDON	Tons	Tons	1927 Tons	1926 Tons	1925 Ton
Plantation	10,640	4,596	54,785	9,865	27,005
Other grades	35	11	127	73	84
LIVERPOOL					
Plantation	†593	†419	†2,071	†818	†2,579
Total tons, London and Liverpool	11,268	5,026	56,983	10,756	29,668

†Official returns from the six recognized public warehouses.

Crude Rubber Arrivals at New York as Reported by Importers

Plantations

	Cases
FEBRUARY 14. By "Masirah," Far East.	
Hood Rubber Co.	*86
Littlejohn & Co., Inc.	112
Raw Products Co.	659
Charles T. Wilson Co., Inc.	599
FEBRUARY 14. By "Silverfir," Far East.	
Hood Rubber Co.	*78
H. Muehlstein & Co., Inc.	480
FEBRUARY 15. By "Atlanta City," Far East.	
H. A. Astlett & Co.	1,193
General Rubber Co.	6,503
Haldane Bierrie & Co., Inc.	100
Hood Rubber Co.	*254
Littlejohn & Co., Inc.	7,239
Meyer & Brown, Inc.	921
The Meyer & Brown Corporation	1,318
H. Muehlstein & Co., Inc.	449
Poel & Kelly, Inc.	534
Raw Products Co.	50
Rogers Brown & Crocker Bros., Inc.	1,387
Charles T. Wilson Co., Inc.	548
FEBRUARY 15. By "Minnekahda," Europe.	
H. A. Astlett & Co.	1,794
General Rubber Co.	850
Charles T. Wilson Co., Inc.	2,182
FEBRUARY 19. By "Batoe," Far East.	
H. A. Astlett & Co.	1,794
Baird Rubber & Trading Co., Inc.	1,025
General Rubber Co.	7,827
Adolph Hirsch & Co., Inc.	32
Hood Rubber Co.	*74
Littlejohn & Co., Inc.	3,184
Meyer & Brown, Inc.	1,242
Meyer & Brown, Inc.	*42
The Meyer & Brown Corporation	479
H. Muehlstein & Co., Inc.	198
Poel & Kelly, Inc.	1,462
Raw Products Co.	55
Rogers Brown & Crocker Bros., Inc.	303
Rogers Brown & Crocker Bros., Inc.	*100
Charles T. Wilson Co., Inc.	1,059
FEBRUARY 19. By "City of Dunedin," Far East.	
H. A. Astlett & Co.	430
Baird Rubber & Trading Co., Inc.	710
Haldane Bierrie & Co., Inc.	150
Littlejohn & Co., Inc.	1,092
Meyer & Brown, Inc.	130
Poel & Kelly, Inc.	190
FEBRUARY 19. By "Nieuw Amsterdam," Rotterdam.	
General Rubber Co.	112
Littlejohn & Co., Inc.	178
H. Muehlstein & Co., Inc.	80
FEBRUARY 22. By "American Shipper," London.	
Charles T. Wilson Co., Inc.	421
FEBRUARY 23. By "Ajax," Far East.	
H. A. Astlett & Co.	413
Baird Rubber & Trading Co., Inc.	22
Baird Rubber & Trading Co., Inc.	*28
General Rubber Co.	3,154
Haldane Bierrie & Co., Inc.	72
Littlejohn & Co., Inc.	1,353
Meyer & Brown, Inc.	200
Meyer & Brown, Inc.	*67
H. Muehlstein & Co., Inc.	328
Poel & Kelly, Inc.	470
Rogers Brown & Crocker Bros., Inc.	420
Charles T. Wilson Co., Inc.	1,046
FEBRUARY 23. By "Alaunia," Liverpool.	
General Rubber Co.	293
FEBRUARY 23. "Poleric," Far East.	
H. A. Astlett & Co.	720
Bowring & Co.	56
General Rubber Co.	15
Meyer & Brown, Inc.	530
FEBRUARY 25. By "Minnewaska," London.	
General Rubber Co.	832
Poel & Kelly, Inc.	50
FEBRUARY 26. By "Binneendyk," Rotterdam.	
General Rubber Co.	453
FEBRUARY 26. By "Pres. Adams," Far East.	
H. A. Astlett & Co.	1,186
Baird Rubber & Trading Co., Inc.	1,292
Paul Bertuch & Co., Inc.	325
General Rubber Co.	1,075
Haldane Bierrie & Co., Inc.	750
Hood Rubber Co.	*640
Littlejohn & Co., Inc.	5,536
Meyer & Brown, Inc.	499
The Meyer & Brown Corporation	1,687
The Meyer & Brown Corporation	*330
H. Muehlstein & Co., Inc.	762
Poel & Kelly, Inc.	1,250
Rogers Brown & Crocker Bros., Inc.	75
Charles T. Wilson Co., Inc.	717
FEBRUARY 26. By "Theseus," Far East.	
H. A. Astlett & Co.	1,154
Baird Rubber & Trading Co., Inc.	1,589
General Rubber Co.	2,761
Haldane Bierrie & Co., Inc.	920
Hood Rubber Co.	*952
Littlejohn & Co., Inc.	6,489
Meyer & Brown, Inc.	376
The Meyer & Brown Corporation	830
H. Muehlstein & Co., Inc.	50
Poel & Kelly, Inc.	1,046
Raw Products Co.	100
Rogers Brown & Crocker Bros., Inc.	1,000
Charles T. Wilson Co., Inc.	754
FEBRUARY 28. By "Baltic," Liverpool.	
General Rubber Co.	165
FEBRUARY 28. By "Clan Matheson," Far East.	
General Rubber Co.	126
MARCH 1. By "Carmania," Liverpool.	
Hood Rubber Co.	*48
Charles T. Wilson Co., Inc.	15
MARCH 1. By "West Carmona," Far East.	
Littlejohn & Co., Inc.	†144
MARCH 1. By "Yangtsze," Far East.	
H. A. Astlett & Co.	1,505
Baird Rubber & Trading Co., Inc.	480
General Rubber Co.	800
Haldane Bierrie & Co., Inc.	850
Littlejohn & Co., Inc.	3,787
Meyer & Brown, Inc.	563
The Meyer & Brown Corporation	155
Poel & Kelly, Inc.	546
Raw Products Co.	150
Rogers Brown & Crocker Bros., Inc.	570
Charles T. Wilson Co., Inc.	1,183
MARCH 2. By "American Trader," London.	
Baird Rubber & Trading Co., Inc.	141
General Rubber Co.	824
Charles T. Wilson Co., Inc.	338
MARCH 2. By "Bowes Castle," Far East.	
H. A. Astlett & Co.	2,925
Baird Rubber & Trading Co., Inc.	2,728
Baird Rubber & Trading Co., Inc.	*100
General Rubber Co.	10,344
Haldane Bierrie & Co., Inc.	200
Hood Rubber Co.	*394
Littlejohn & Co., Inc.	7,133
Meyer & Brown, Inc.	1,334
The Meyer & Brown Corporation	2,495
H. Muehlstein & Co., Inc.	754
Poel & Kelly, Inc.	1,322
Rogers Brown & Crocker Bros., Inc.	1,512
Charles T. Wilson Co., Inc.	1,490
MARCH 3. By "Silverelm," Far East.	
H. A. Astlett & Co.	2,088
Baird Rubber & Trading Co., Inc.	650
General Rubber Co.	10,628
Haldane Bierrie & Co., Inc.	821
Hood Rubber Co.	*150
Littlejohn & Co., Inc.	4,558
Meyer & Brown, Inc.	232
The Meyer & Brown Corporation	1,942
H. Muehlstein & Co., Inc.	1,269
Poel & Kelly, Inc.	1,600
Raw Products Co. bales	165
Rogers Brown & Crocker Bros., Inc.	2,954
Charles T. Wilson Co., Inc.	2,200
MARCH 4. By "Blommersdyk," Rotterdam.	
General Rubber Co.	66
Littlejohn & Co., Inc.	108
Rogers Brown & Crocker Bros., Inc.	112
MARCH 4. By "Taibu Maru," Hamburg.	
General Rubber Co.	96
MARCH 5. By "City of Athens," Europe.	
General Rubber Co.	752
Littlejohn & Co., Inc.	740
Meyer & Brown, Inc.	112
The Meyer & Brown Corporation	2,918
Charles T. Wilson Co., Inc.	112
MARCH 6. By "Japanese Prince," Far East.	
H. A. Astlett & Co.	1,120
Baird Rubber & Trading Co., Inc.	1,984
Baird Rubber & Trading Co., Inc.	*194
General Rubber Co.	5,455
Haldane Bierrie & Co., Inc.	118
Littlejohn & Co., Inc.	5,429
The Meyer & Brown Corporation	1,693
H. Muehlstein & Co., Inc.	223
Poel & Kelly, Inc.	503
Raw Products Co.	150
Rogers Brown & Crocker Bros., Inc.	1,218
Charles T. Wilson Co., Inc.	1,933
MARCH 7. By "Ascania," Far East.	
H. A. Astlett & Co.	64
General Rubber Co.	70
Littlejohn & Co., Inc.	171
H. Muehlstein & Co., Inc.	162
Charles T. Wilson Co., Inc.	100
MARCH 7. By "Matra," Far East.	
Hood Rubber Co.	*50
Littlejohn & Co., Inc.	112
The Meyer & Brown Corporation	25
Rogers Brown & Crocker Bros., Inc.	155
MARCH 7. By "Minnetonka," London.	
Baird Rubber & Trading Co., Inc.	206
General Rubber Co.	298
Adolph Hirsch & Co., Inc.	45
Littlejohn & Co., Inc.	200
Charles T. Wilson Co., Inc.	711
MARCH 8. By "Aurania," London.	
Charles T. Wilson Co., Inc.	51
MARCH 8. By "Westerdyk," Rotterdam.	
The Meyer & Brown Corporation	254
Rogers Brown & Crocker Bros., Inc.	84
MARCH 9. By "Cedric," Europe.	
General Rubber Co.	74
MARCH 9. By "Colorado," Far East.	
H. A. Astlett & Co.	1,398
Baird Rubber & Trading Co., Inc.	900
General Rubber Co.	2,205
Haldane Bierrie & Co., Inc.	280
Hood Rubber Co.	*150
Littlejohn & Co., Inc.	4,623
Meyer & Brown, Inc.	120
The Meyer & Brown Corporation	360
H. Muehlstein & Co., Inc.	75
Poel & Kelly, Inc.	400
Rogers Brown & Crocker Bros., Inc.	220
Charles T. Wilson Co., Inc.	499
MARCH 9. By "Garoet," Far East.	
H. A. Astlett & Co.	970
Baird Rubber & Trading Co., Inc.	633
General Rubber Co.	6,789
Haldane Bierrie & Co., Inc.	117
Hood Rubber Co.	*590
Littlejohn & Co., Inc.	3,804
Meyer & Brown, Inc.	337
The Meyer & Brown Corporation	120
The Meyer & Brown Corporation	*350
H. Muehlstein & Co., Inc.	69
Poel & Kelly, Inc.	1,668
Rogers Brown & Crocker Bros., Inc.	1,484
Charles T. Wilson Co., Inc.	2,224
MARCH 9. By "Naperian," London.	
Hood Rubber Co.	*603
MARCH 9. By "Talisman," Antwerp.	
Bowring & Co.	356
MARCH 11. By "Pres. Garfield," Far East.	
H. A. Astlett & Co.	2,720
Baird Rubber & Trading Co., Inc.	624
Paul Bertuch & Co., Inc.	400
General Rubber Co.	804
Haldane Bierrie & Co., Inc.	150
Hood Rubber Co.	*179
Littlejohn & Co., Inc.	3,458
Meyer & Brown, Inc.	180
The Meyer & Brown Corporation	1,094
H. Muehlstein & Co., Inc.	565
Poel & Kelly, Inc.	525
Poel & Kelly, Inc.	*180
Raw Products Co.	100
Rogers Brown & Crocker Bros., Inc.	1,411
Charles T. Wilson Co., Inc.	521
MARCH 13. By "Delilian," Antwerp.	
Bowring & Co.	190
MARCH 13. By "Pres. Pierce," Far East.	
Baird Rubber & Trading Co., Inc.	†50
Poel & Kelly, Inc.	†250
Rogers Brown & Crocker Bros., Inc.	†112
MARCH 13. By "Pres. Taft," Far East.	
Poel & Kelly, Inc.	†100
MARCH 13. By "Volendam," Europe.	
Littlejohn & Co., Inc.	393
MARCH 14. By "Caronia," Europe.	
General Rubber Co.	57
Hood Rubber Co.	*10
Charles T. Wilson Co., Inc.	25
MARCH 14. By "City of Lyons," Far East.	
H. A. Astlett & Co.	1,809
Baird Rubber & Trading Co., Inc.	1,180
Bowring & Co.	102
General Rubber Co.	1,218
Haldane Bierrie & Co., Inc.	350
Hood Rubber Co.	*134
Littlejohn & Co., Inc.	784
The Meyer & Brown Corporation	2,056
H. Muehlstein & Co., Inc.	483
Poel & Kelly, Inc.	1,050
Charles T. Wilson Co., Inc.	554
MARCH 14. By "Fairfield City," Far East.	
H. A. Astlett & Co.	1,968
Baird Rubber & Trading Co., Inc.	1,443
General Rubber Co.	4,854
Hood Rubber Co.	140
Littlejohn & Co., Inc.	4,096
Meyer & Brown, Inc.	300
The Meyer & Brown Corporation	1,320
Poel & Kelly, Inc.	650
Rogers Brown & Crocker Bros., Inc.	1,361
Charles T. Wilson Co., Inc.	382
MARCH 18. By "Harold Dollar," Far East.	
H. A. Astlett & Co.	†201

*Arrived at Boston.
†Arrived at Pacific Coast.

Africans

	Cases
FEBRUARY 18. By "New Britain," Antwerp.	
Baird Rubber & Trading Co., Inc.....	61
FEBRUARY 22. By "Alaunia," Liverpool.	
Littlejohn & Co., Inc.....	81
MARCH 8. By "Aurania," Liverpool.	
Littlejohn & Co., Inc.....	388
MARCH 9. By "Talisman," Antwerp.	
Bowring & Co.....bags	83
MARCH 14. By "Caronia," Liverpool.	
Littlejohn & Co., Inc.....	22

‡Arrived at Laredo, Texas.

Balata

	Cases
FEBRUARY 15. By "Swineburne," Brazil.	
H. A. Astlett & Co.....	40
General Rubber Co.....	86
FEBRUARY 25. By "Aidan," Brazil.	
H. A. Astlett & Co.....	112
Paul Bertuch & Co., Inc.....	85
MARCH 10. By "Cuthbert," Brazil.	
H. A. Astlett & Co.....	162
Paul Bertuch & Co., Inc.....	76

Rubber Latex

	Gallons
FEBRUARY 15. By "Atlanta City," Far East.	
General Rubber Co.....	67,995

Guayule

	Cases
FEBRUARY 15. By "Railroad," Mexico.	
Continental Rubber Co. of New York...	‡500
FEBRUARY 16. By "Railroad," Mexico.	
Continental Rubber Co. of New York....	‡560
FEBRUARY 24. By "Railroad," Mexico.	
Continental Rubber Co. of New York....	‡500
FEBRUARY 25. By "Mexico," Mexico.	
Continental Rubber Co. of New York....	1,060
FEBRUARY 25. By "Railroad," Mexico.	
Continental Rubber Co. of New York...	‡1,120
MARCH 9. By "Medina," Mexico.	
Baird Rubber & Trading Co., Inc.....	400
MARCH 9. By "Railroad," Mexico.	
Continental Rubber Co. of New York...	‡1,060
MARCH 11. By "Monterey," Mexico.	
Continental Rubber Co. of New York....	1,120

Paras and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Cametá Cases
FEBRUARY 15. By "Swineburne," Brazil.					
H. A. Astlett & Co.....	26	...	101	...	...
General Rubber Co.....	907	62	444	102	...
Littlejohn & Co., Inc.....	737	7	139	84	...
Poel & Kelly, Inc.....	228	117	134	198	...
FEBRUARY 25. By "Aidan," Brazil.					
H. A. Astlett & Co.....	147	...	172	38	...
Paul Bertuch & Co., Inc.....	64	...	...	105	...
General Rubber Co.....	1,150	38	387	532	...
Meyer & Brown, Inc.....	...	...	...	14	...
Littlejohn & Co., Inc.....	201	66	189	56	...
The Meyer & Brown Corp...bags	...	...	318	145	15
Poel & Kelly, Inc.....	2	17	...	...	...
MARCH 10. By "Cuthbert," Brazil.					
H. A. Astlett & Co.....	178	9	310	33	...
Paul Bertuch & Co., Inc.....	416	...	124	169	...
General Rubber Co.....	263	70	130	327	17
Littlejohn & Co., Inc.....	693	...	438	...	...
Poel & Kelly, Inc.....	7	...	108	...	...

Exports of Rubber, Caucho and Balata from the Amazons During 1926

Exporters	Europe Fine Kilos	Europe Medium Kilos	Europe Coarse Kilos	Europe Caucho Kilos	Europe Balata Kilos	Europe Total Kilos	America Fine Kilos	America Medium Kilos	America Coarse Kilos	America Caucho Kilos	America Balata Kilos	America Total Kilos	Grand Total Kilos
General Rubber Co. of Brazil—Para-Manaos	1,459,042	136,971	33,511	220,555	46,354	1,896,433	2,284,696	226,141	746,373	797,425	56,409	4,111,044	6,007,477
Berringer & Co.—Para-Manaos	1,821,541	167,774	146,010	485,142	261,780	2,882,247	1,227,719	81,030	417,868	1,137,525	114,688	2,978,830	5,861,077
J. G. Araujo & Co., Ltd.—Manaos	529,472	81,913	36,037	111,841	476,781	1,236,044	1,496,224	66,340	247,527	554,788	10,470	2,375,349	3,611,393
Ranniger & Co.—Para	832,043	49,094	91,522	184,540	2,861	1,160,060	493,303	61,347	101,326	217,929	.....	873,905	2,033,965
F. Chamié—Para	6,160	.....	.....	.....	.....	6,160	922,784	11,158	595,072	190,185	4,950	1,724,149	1,730,309
Suarez Filho & Co.—Para.	509,993	1,247	554	424	.....	512,218	501,067	.....	42,494	287,522	.....	831,083	1,343,301
Adelbert H. Alden, Ltd.—Para-Manaos	653,732	57,735	69,075	15,907	40,153	836,602	.....	.....	.....	.....	.....	.....	836,602
Lyra & Co.—Manaos	253,511	44,367	79,082	77,360	9,883	464,203	201,616	6,396	64,383	88,242	.....	360,637	824,840
S. Bitar & Irmãos—Para	213,866	7,815	57,141	86,501	.....	365,323	200,933	8,968	68,237	171,663	.....	449,801	815,124
Suter Baumann & Co.—Para-Manaos	323,697	16,395	14,827	87,222	177,110	619,251	22,290	4,320	81,027	45,090	530	153,257	772,508
Companhia Fluvial—Manaos	204,582	14,597	17,541	195,021	.....	431,741	146,747	13,508	26,559	45,765	.....	232,579	664,320
Jos. Origet & Co.—Para.	96,207	2,348	2,422	217,378	.....	318,355	.....	.....	.....	.....	.....	.....	318,355
Ferreira Costa & Co.—Para	17,360	.....	.....	5,040	.....	22,400	25,230	1,500	15,240	148,872	.....	190,842	213,242
B. Levy & Co.—Manaos	53,330	5,280	1,310	14,690	19,316	93,926	42,240	1,280	1,780	320	16,296	61,916	155,842
Amazon River St. Nav. Co. Ltd.—Para	71,507	4,075	14,512	46,134	.....	136,228	.....	.....	.....	.....	.....	.....	136,228
Semper & Co.—Manaos	52,530	1,925	3,090	10,240	4,233	72,018	31,064	640	4,245	.....	18,937	54,886	126,904
Higson, Jones & Co.—Manaos	21,630	366	195	4,373	6,491	33,055	330	.....	2,772	.....	29,860	32,962	66,017
Holden & Co.—Para	.....	.....	.....	.....	.....	.....	16,320	.....	.....	.....	.....	16,320	16,320
Sundry—Para	14,386	1,380	1,715	649	.....	18,130	66,703	1,020	9,630	143,250	.....	220,603	238,733
Total from Para and Manaos	7,134,589	593,282	568,544	1,763,017	1,044,962	11,104,394	7,679,266	483,648	2,424,533	3,828,576	252,140	14,668,163	25,772,557
From Iquitos	11,180	12,025	4,374	9,520	2,023,300	2,060,399	69,130	290,695	32,084	33,565	174,010	599,484	2,659,883
Grand total from the Amazons	7,145,769	605,307	572,918	1,772,537	3,068,262	13,164,793	7,748,396	774,343	2,456,617	3,862,141	426,150	15,267,647	28,432,440

Destinations

	From Para Kilos	From Manaos Kilos	From Iquitos Kilos	Total Kilos
United States	5,036,454	9,384,017	599,484	15,019,955
England	1,042,700	4,145,118	1,155,606	6,343,424
Germany	1,176,568	2,719,722	220,927	4,117,217
France	1,169,016	552,580	653,281	2,374,877
Brazil (South)	227,652	20,030	.....	247,682
Belgium	22,360	77,250	27,489	127,099
Italy	109,304	5,250	3,096	117,650
Holland	21,575	31,780	.....	53,355
Spain	.....	31,181	.....	31,181
Totals	8,805,629	16,966,928	2,659,883	28,432,440

Compiled by Berringer & Co., Para, Brazil.

United States Crude and Waste Rubber Imports for 1927 (By Months)

	Plantations	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1927	Total 1926	Balata	Miscellaneous	Waste
January ..... *tons*	42,646	2,378	269	299	144	....	45,736	38,697	106	1,508	447
February	25,326	1,668	213	203	190	....	27,600	34,067	119	935	953
Total, two months, 1927..*tons*	67,972	4,046	482	502	334	....	73,336	.....	225	2,443	1,400
Totals, two months, 1926..*tons*	68,204	2,404	1,018	765	357	16	.....	72,764	113	1,335	1,950

Compiled from statistics supplied by the Rubber Association of America, Inc.

United States Rubber Statistics

Imports of Crude and Manufactured Rubber

	December, 1926		Twelve Months Ended December, 1926	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	94,568,880	$33,261,366	925,877,712	$505,817,807
Balata	148,226	58,231	792,165	327,213
Jelutong or Pontianak	1,216,552	264,229	16,268,345	3,127,757
Gutta percha	285,785	40,710	3,236,704	661,156
Guayule	499,384	121,502	9,643,131	2,562,096
Rubber scrap	1,219,855	83,543	31,928,633	1,483,179
Totals	87,938,682	$33,948,863	987,746,690	$515,957,485
Chicle ...*dutiable*	836,360	$440,155	12,381,075	$6,204,264
MANUFACTURED—*dutiable*				
Rubber belting	27,056	$17,299	731,827	$488,486
Rubber tires	109	2,912	17,504	161,303
Other rubber manufactures of substitutes for rubber	.....	99,071	.....	1,328,488
Totals	27,165	$119,282	749,331	$1,978,277

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	4,265,902	$1,841,305	39,583,454	$22,470,583
Balata	29,147	11,550	398,897	219,876
Gutta percha and rubber substitutes and scrap	.....	.....	158,637	29,306
Rubber manufactures	.....	17,388	.....	146,611
Totals	.....	$1,870,243	.....	$22,866,376

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	1,400,168	$149,021	12,075,640	$1,425,460
Scrap and old	2,967,289	203,968	29,842,702	1,946,894
Footwear				
Boots ...*pairs*	128,996	281,724	1,013,112	2,371,753
Shoes ...*pairs*	95,888	89,058	1,485,751	1,451,798
Canvas shoes with rubber soles ...*pairs*	288,223	195,066	5,469,004	3,968,566
Rubber water bottles and fountain syringes..*number*	33,214	22,346	287,412	207,198
Rubber gloves.....*doz. pairs*	7,978	22,758	69,588	243,543
Other druggists' rubber sundries	.....	30,814	.....	487,356
Bathing caps.....*dozen*	5,142	7,652	151,174	334,313
Hard rubber goods				
Electrical hard rubber goods	65,254	17,702	839,058	278,701
Other hard rubber goods	.....	31,293	.....	403,174
Tires				
Casings, automobile.*number*	152,709	2,045,727	1,497,132	24,358,907
Tubes, automobiles.*number*	90,715	206,042	1,127,175	3,024,177
Other casings and tubes *number*	2,794	8,345	70,806	218,769
Solid tires for automobiles and motor trucks.*number*	8,381	288,626	98,122	3,457,505
Others	127,752	33,586	1,551,006	502,464
Tire accessories	.....	117,468	.....	1,612,074
Rubber and friction tape	100,575	27,931	1,087,447	351,860
Belting	515,167	284,484	4,175,810	2,657,036
Hose	589,276	229,310	6,124,960	2,523,402
Packing	261,078	127,895	2,149,337	1,096,985
Soles and heels	455,299	147,982	4,277,301	1,363,489
Thread	93,772	128,175	1,459,929	1,958,246
Rubber bands and erasers	72,304	55,364	685,493	550,383
Other rubber manufactures	.....	174,538	.....	2,411,207
Totals	.....	$4,926,875	.....	$59,205,260
Rubber toys, balls and balloons	.....	$62,646	.....	$846,072

Imports of Crude Rubber Into the United States by Customs Districts

	* January, 1926		* January, 1927	
	Pounds	Value	Pounds	Value
Massachusetts	5,507,022	$4,441,939	6,211,909	$2,240,518
Buffalo	30,000	12,600	.....	.....
New York	87,137,455	66,223,989	87,760,726	33,333,513
Maryland	.....	.....	514,315	200,599
New Orleans	697	174	.....	.....
Los Angeles	1,834,898	1,456,833	1,703,752	623,164
San Francisco	228,984	180,824	706,762	280,230
Oregon	.....	.....	184,800	75,695
Washington	246,400	211,792	.....	.....
	94,985,456	$72,528,151	97,082,264	$36,753,719

* Including Latex Dry Rubber Content.

DURING 1926 AMERICAN EXPORTS OF RUBBER GLOVES TOTALED 69,588 dozen pairs, value $243,543. Shipments during the year of rubber bands and erasers totaled 685,493 pounds, value $550,383.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished those who read them. The Editor is therefore glad to have those interested communicate with him.

NUMBER	INQUIRY
930	Manufacturers of "Rubberite."
931	Machinery for molding plastics.
932	Fabric puller.
933	Manufacturer of Vulcanex.
934	Source of supply for rubber tiling.
935	Manufacturer of gravitometer.
936	Gage for gaging thickness of coated fabric.
937	Source of supply for special size suction cups.
938	Manufacturers of corrugated hose.

Foreign Trade Information

For further information concerning the inquiries listed below, address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

NUMBER	COUNTRY AND COMMODITY	PURCHASE OR AGENCY
24,156	Iraq. Rubber boots	Purchase and agency
24,179	Germany. Automobile and truck tires	Purchase and agency
24,180	Denmark. Canvas rubber-soled shoes	Agency
24,181	South Africa. Rubber goods, especially rubber gloves	Agency
24,219	Denmark. Rubber boots and shoes	Agency
24,220	Germany. Mechanical rubber toys	Purchase
24,221	Egypt. Automobile tires	Agency
24,389	Austria. Druggists' rubber sundries	Agency
24,402	Germany. Druggists' rubber sundries, and technical rubber goods	Purchase and agency
24,403	England. Rubber bands	Agency
24,460	Germany. Druggists' rubber sundries and specialties	Agency
24,464	Germany. Rubber articles	Purchase and agency
24,494	England. Rubber specialties	Agency
24,498	Spain. Rubber goods	Agency
24,507	Finland. Crude rubber and chemicals for rubber manufacturing	Agency
24,532	Czechoslovakia. Dental supplies, including rubber and gutta percha	Agency
24,535	Canada. Druggists' rubber sundries	Agency
24,536	Persian Gulf, (Lingah). Canvas and leather shoes, with rubber soles	Purchase and agency
24,538	Germany. Rubber toys	Purchase and agency
24,558	Sweden. Galoshes	Agency
24,564	Switzerland. Sponge rubber substitute for inner tubes	Purchase

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C. The publications which give details of the rubber industry in some one country are marked with an asterisk.

NUMBER	SPECIAL CIRCULAR
1417	"Tire Exporters' Weekly News Letter."
1420	"Crude Rubber News Letter."
*1421	"British Market for Tire Repair Outfits."
*1423	"January Imports of Rubber Tires Into the United States."
1427	"Tire Exporters' Weekly News Letter."
1429	"Mechanical Rubber Goods Exporters' Monthly News Letter."
*1430	"Canadian Tire Exports During January, 1927."
*1433	"British Exports of Solid Tires During the Calendar Year 1926."
1434	"Tire Exporters' Weekly News Letter."
1436	"Crude Rubber News Letter."
*1437	"British Exports of Automobile Casings During January, 1927."
*1439	"Preliminary Statistics of United States Crude Rubber Imports—February, 1927."
1441	"Tire Exporters' Weekly News Letter."

N. A. C. M. TO HOLD SPRING MEETING

A joint meeting of the National Association of Cotton Manufacturers and the American Cotton Manufacturers Association will be held at the Hotel Traymore, Atlantic City, New Jersey, from May 12-14, 1927. Matters of importance to the industry will be discussed.

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